UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
EDISON, NEW JERSEY 08837

ADMINISTRATIVE RECORD FILE

WALTON'S FARM SITE
DELRAN TOWNSHIP
BURLINGTON COUNTY, NEW JERSEY

Prepared for:
Donald R. Graham
U.S. EPA Region II
Removal Action Branch
Edison, New Jersey

Prepared by:
U.S. EPA Technical Assistance Team
Roy F. Weston, Inc.
Major Programs Division
Edison, New Jersey

November 1991

Administrative Records In Local Repositories

The "administrative record" is the collection of documents which form the basis for the selection of a response action at a Superfund site. Under Section 113 (K) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), EPA is required to establish an administrative record for every Superfund site and to make a copy of the administrative record available at or near the site.

The administrative record file must be reasonably available for public review during normal business hours. The record file should be treated as a non-circulating reference document. This will allow the public greater access to the volumes and also minimize the risk of loss or damage. Individuals may photocopy any documents contained in the record file, according to the photocopying procedures at the local repository.

The documents in the administrative record file may become damaged or lost during use. If this occurs, the local repository manager should contact the EPA Regional Office for replacements. Documents may be added to the record file as the site work progresses. Periodically, EPA may send supplemental volumes and indexes directly to the local repository. These supplements should be placed with the initial record file.

The administrative record file will be maintained at the local repository until further notice. Questions regarding the maintenance of the record file should be directed to the EPA Regional Office.

The Agency welcomes comments at any time on documents contained in the administrative record file. Please send any such comments to Donald R. Graham, On-Scene Coordinator, U.S. EPA, Region II, 2890 Woodbridge Avenue, Building 209, Edison, New Jersey 08837. The Agency may hold formal public comment periods at certain stages of the response process. The public is urged to use these formal review periods to submit their comments.

For further information on the administrative record file, contact Donald R. Graham, On-Scene Coordinator, (908) 321-4345.

WALTON'S FARM SITE

ADMINISTRATIVE RECORD FILE

CONTENTS

WALTON'S FARM SITE

ADMINISTRATIVE RECORD FILE

INDEX OF DOCUMENTS

The index of documents contains the following information about each document:

Document #:	Site Code-Section Number - Document Number
Title:	Abstract of Document Contents
Category:	Document Category/Section of Administrative Record File
Author:	Writer and Affiliation
Recipient:	Addressee or Public and Affiliation, if applicable
Date:	When Document was Created or Transmitted

NOTE: Items in the administrative record are for public access, and should be removed from the file only for copying. The cost of reproduction of the documents in the file is the responsibility of the person requesting the copy.

WALTON'S FARM SITE
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

Document #: WF-1-1
Title: Preliminary Assessment Report
Category: Site Identification
Author: David Van Eck
Division of Hazardous Waste Management
New Jersey Department of Environmental Protection
Recipient: File
Date: August 1, 1986

Document #: WF-1-2
Title: Responsible Party Investigative Summary
Category: Site Identification
Author: Robert K. Beretsky
Recipient: File
Date: April 18, 1989

Document #: WF-1-3
Title: Removal Request Letter
Category: Site Identification
Author: Lance Miller, Acting Director
Division of Hazardous Waste Management
New Jersey Department of Environmental Protection
Recipient: Stephen Luftig, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency, Region II
Date: January 2, 1990

Document #: WF-2-1
Title: Action Memorandum
Category: Removal Response
Author: Donald R. Graham, On-Scene Coordinator
Removal Action Branch
U.S. Environmental Protection Agency, Region II
Recipient: Richard Caspe, P.E., Director
Emergency and Remedial Response Division,
U.S. Environmental Protection Agency, Region II
Date: January 7, 1991

Document #: WF-2-2
Title: Results of Priority Pollutant Analysis of Samples Collected by NJDEP on October 28, 1986
Category: Removal Response
Author: S-R Analytical, Inc.
Recipient: Division of Hazardous Waste Management,
New Jersey Department of Environmental Protection
Date: November 24, 1986

Document #: WF-2-3
Title: Results of Dioxin Analysis of Soil Samples Collected by U.S. EPA Technical Assistance Team on March 3, 1990
Category: Removal Response
Author: Southwest Research Institute
Recipient: Richard Spear
Environmental Services Division
U.S. Environmental Protection Agency, Region II
Date: April 13, 1990

Document #: WF-2-4
Title: Sampling Trip Report for Samples Collected by U.S. EPA Technical Assistance Team on March 21, 1991, Analyzed for TCL Pesticides, Arsenic and Thallium
Category: Removal Response
Author: Eric Wilson
Technical Assistance Team
U.S. Environmental Protection Agency, Region II
Recipient: Donald R. Graham
Removal Action Branch,
U.S. Environmental Protection Agency, Region II
Date: March 27, 1991

Document #: WF-3-1
Title: Administrative Order on Consent between U.S. EPA Region II and PPG Industries, Inc.[1]
Category: Enforcement
Author: N/A
Recipient: N/A
Date: October 29, 1991

Document #: WF-4-1
Title: PCDD/PCDF Health Consultation
Category: Health Assessments
Author: Allen Susten, Ph. D.
Agency for Toxic Substances and Disease Registry
U.S. Department of Health and Human Services
Recipient: William Nelson
Agency for Toxic Substances and Disease Registry
U.S. Department of Health and Human Services
Date: April 27, 1990

Document #: WF-4-2
Title: DDT Health Consultation
Category: Health Assessment
Author: Lynn C. Wilder
Agency for Toxic Substances and Disease Registry
U.S. Department of Health and Human Services
Recipient: Lisa Voyce
Agency for Toxic Substances and Disease Registry
U.S. Department of Health and Human Services
Date: June 20, 1990

Document #: WF-5-1
Title: Press Release Announcing Public Availability Sessions
Category: Public Participation
Author: Mary Breitenbach
Office of External Programs
U.S. Environmental Protection Agency, Region II
Recipient: Burlington County Times Newspaper
Date: November 18, 1991

[1]Relevant excerpts from the Site Operations Plan are included with the Administrative Order on Consent. The Site Operations Plan in its entirety is available for review at EPA offices in Edison, NJ, for further information contact Donald R. Graham at (908) 321-4345.

Document #: WF-5-2
Title: Fact Sheet
Category: Public Participation
Author: Mary Breitenbach
Office of External Programs,
U.S. Environmental Protection Agency, Region II
Recipient: Public Distribution
Date: November 18, 1991

Document #: WF-5-3
Title: Handout Announcing Public Availability Session
Category: Public Participation
Author: Mary Breitenbach
Office of External Programs,
U.S. Environmental Protection Agency, Region II
Recipient: Distribution to Neighboring Residents
Date: November 14, 1991

Document #: WF-6-1
Title: DDAG Review and Comment on Walton's Farm Site
Category: Technical Sources and Guidance Documents
Author: Paul E. des Rosiers, Chairman
Dioxin Disposal Advisory Group
Recipient: Donald R. Graham, On-Scene-Coordinator,
Removal Action Branch
U.S. Environmental Protection Agency, Region II
Date: October 10, 1991

Document #: WF-6-2
Title: BTAG Comments on the "Draft Pre-Removal Sampling and Analysis Plan"
Category: Technical Sources and Guidance Documents
Author: Shari Stevens, Coordinator
Biological Technical Assistance Group
U.S. Environmental Agency, Region II
Recipient: Donald R. Graham, On-Scene Coordinator,
Removal Action Branch,
U.S. Environmental Protection Agency, Region II
Date: September 25, 1991

Document #: WF-6-3
Title: List of EPA Regional Guidance Documents
Category: Technical Sources and Guidance Documents
Author: N/A
Recipient: N/A
Date: N/A

Document #: WF-7-1
Title: Walton's Farm Property
Category: Correspondence
Author: Mr. Donald R. Graham, On-Scene Coordinator
United States Environmental Protection Agency
Region II
Recipient: Rudolph Camishion
Date: April 16, 1996

Document #: WF-7-2
Title: Walton's Farm Site, Delran, New Jersey, Administrative Order No. II-CERCLA-20101
Category: Correspondence
Author: Ms. Kathleen C. Callahan, Director, Emergency and Remedial Response Division, United States Environmental Protection Agency, Region 2
Recipient: Mr. Mark Terril, PPG Industries, Inc.
Date: November 7, 1995

Preliminary Assessment

Walton's Farm
Creek Road/Delran Township
Burlington County, New Jersey

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER

II. SITE NAME AND LOCATION

01 SITE NAME	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Walton's Farm	Creek Road

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Delran	NJ	08075	Burlington		

09 COORDINATES LATITUDE	LONGITUDE	
40° 00' 58"	74° 54' 51"	BLOCK: 119 LOT: 16

10 DIRECTIONS TO SITE
295 south to Delran Exit; Creek Road towards Delran. Turn right onto long gravel drive past Starke Lane, take drive to end, past owner's house and pond. Site lies on the southeast corner of the farm by the riverbank.

III. RESPONSIBLE PARTIES

01 OWNER	02 STREET
Rudolph Camishion	Creek Road

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Delran	NJ	08075	( )

07 OPERATOR	08 STREET

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 06 12 86 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)	03 YEARS OF OPERATION
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN	1940's (BEGINNING YEAR) _____ (ENDING YEAR) ☒ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Sulfur, possibly pesticides and dioxin.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Vegetative strain and possibly health hazards.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspection on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
David VanEck	NJDEP-DHWM-BSA	(609) 984-3224

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
David VanEck	NJDEP	DHWM-BSA	(609) 984-3224	08 01 86 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [ ] A. SOLID
- [X] B. POWDER, FINES
- [ ] C. SLUDGE
- [ ] D. OTHER _____ (Specify)
- [ ] E. SLURRY
- [ ] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS 27
NO OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [X] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [X] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES	unknown		possibly present
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS	unknown		sulfur used as fill
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
IOC	Sulfur	7704349	used as fill	near pure	
PSD	Pesticides	999	possibly present	unknown	
OCC	TCDD (dioxin)	1746016	possibly present	unknown	

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

DEP-DHWM-BSA Memo

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 ☒ B. SURFACE WATER CONTAMINATION
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

Fill area lies directly on the bank of the Rancocas River. Material could easily erode into the river.

01 ☒ C. CONTAMINATION OF AIR
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☒ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

Sulfur caught fire, reportedly in the mid 1950's.

01 ☒ D. FIRE/EXPLOSIVE CONDITIONS
02 ☒ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

Sulfur caught fire and burned for several days in the mid 1950's.

01 ☐ E. [illegible]
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres)
04 NARRATIVE DESCRIPTION

Fill area has no lining.

01 ☐ G. DRINKING WATER CONTAMINATION
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 ☒ I. POPULATION EXPOSURE/INJURY
02 ☐ OBSERVED (DATE _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

Sulfur fill area has no fence.

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ J. DAMAGE TO FLORA — 02 ☒ OBSERVED (DATE: 6/12/86) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

In most parts of the fill area, no vegetation grows.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES — 02 ☒ OBSERVED (DATE: 6/12/86) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Area has no containment. Sulfur fill lies on the bank of the Rancocas River with material apparently eroding into the river.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Lying on the bank of the Rancocas River, the fill material could easily wash into the river.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☒ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Dumping occurred in the late 1940's. There were no regulations then preventing the landowner from accepting sulfur as fill.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

As the sulfur originated from Pulverizing Services in Moorestown, the fill is suspected to possibly contain other hazardous substances, including pesticides and dioxin.

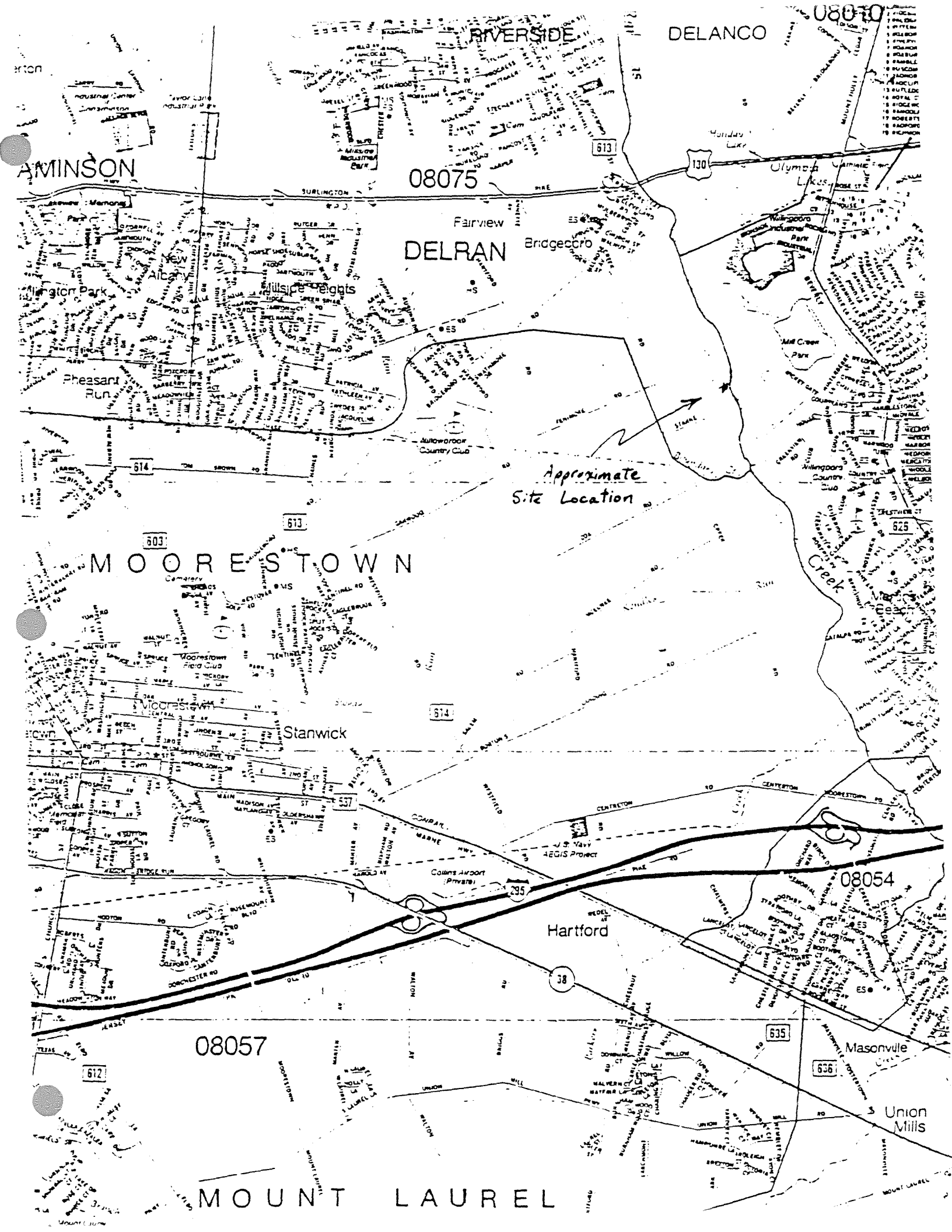
III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

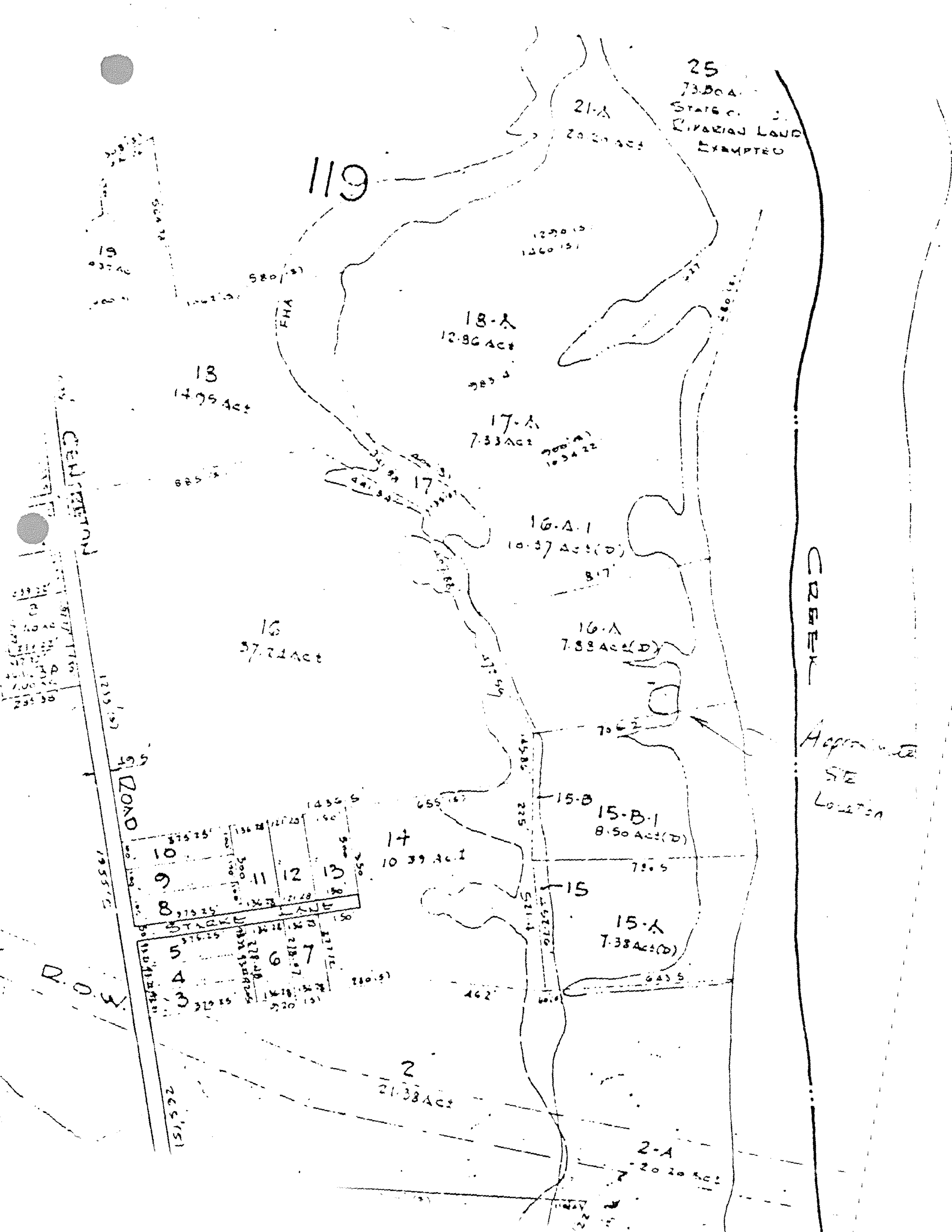
IV. COMMENTS

V. SOURCES OF INFORMATION

DEP-DHWM-BSA Memo.

EPA FORM 2070-12 (7-81)


RIVERSIDE
DELANCO
08010
AMINSON
08075
Fairview
Bridgecoro
DELRAN
New Albany
Hillside Heights
Pheasant Run
Willowbrook Country Club
Approximate Site Location
MOORESTOWN
Moorestown Field Club
Moorestown
Stanwick
Collins Airport (Private)
Hartford
08054
08057
Masonville
Union Mills
MOUNT LAUREL
613
614
603
537
295
38
635
636
612
130



25
73.80 A.
Riparian Land
Exempted
21-A
119
19
FHA
18-A
12.86 Acs
13
14.95 Acs
17-A
7.33 Acs
17
16-A-1
10.37 Acs(D)
16
37.72 Acs
16-A
7.38 Acs(D)
CREEK
Centerton
Road
15-B
15-B-1
8.50 Acs(D)
14
10.39 Ac.s
10
9
8
11
12
13
15
Starke Lane
15-A
7.38 Acs(D)
5
4
3
6
7
R.O.W.
2
21.38 Acs
2-A

RESPONSIBLE PARTY INVESTIGATIONS UNIT
INVESTIGATE SUMMARY

WALTONS FARM
(APRIL 18, 1989)

CASE SUMMARY:

The Waltons Farm site is located off of Creek Road in a rural section of Delran Township, Burlington County, New Jersey. The farm was reportedly used for disposal of powdered chemicals, including pesticides, from the early 1940s to at least 1952 when the dump was purposely set to burn. Allegedly, dumping at the farm discontinued after the fire. The farm itself, designated Block 119, Lot 16 on the current Delran tax map, encompasses 37.42 acres, however the dumping area appears to comprise little more than a 50' x 50' area. The disposal area is easily accessible and is located directly adjacent to the mud flats of Rancocas Creek.

A title/deed search at the Burlington County Hall of Records revealed the following ownership information:

October 24, 1893 - Charles Robeson obtained title to the property from Charles Shinn, Sheriff of Burlington County, by virtue of placing the highest bid ($2,000) for the property during a public auction on August 18, 1893. The previous owners, Richard S. and Ella Parker (possibly Packer) apparently mortgaged the property from Charles Robeson at one time.

December 6, 1900 - Property ownership is conveyed from Hewlings Lippincott et al, trustees in bankruptcy for Frank B. Lambert and Charles G. Robeson individually and trading as F.B. Lambert and Company, to Wallace Gennett during a public auction on November 15, 1900. Mr. Gennett submitted the highest bid for the property at $2,225.00.

November 24, 1906 - Wallace and Lydia M. Gennett transfer property ownership to Samuel Caldwell for a sum of $2,900.00.

November 3, 1938 - The Burlington County Trust Company, Trustee under the will of Asa M. Stackhouse deceased, for Willie S. Stackhouse, acquires title to the property from Burlington County Sheriff, John M. Chant. The property was acquired by the Burlington County Trust Company during a public auction for a sum of $100.00. The deed book references a court hearing of September 15, 1938 in which the Burlington County Trust Company (as trustee for William S. Stackhouse) is listed as the complainant and Samuel Caldwell, Rebecca M. Caldwell, the F.W. Tunnell Company, Riverside Trust Company, Earl Applegate, Helen Applegate and George Caldwell are listed as the defendants. The exact nature of the case is unknown, but apparently Mr. Caldwell was in debt (probably mortgage) to Mr. Stackhouse.

December 1, 1938 - Property ownership is conveyed from the Burlington County Trust Company, Trustee under the will of Asa M. Stackhouse deceased, for Willie S. Stackhouse, to Henry R. Walton 2nd for a sum of $1.00.

July 30, 1981 - Property ownership is transferred to H. Richard Walton, Judith W. Davis and E. Dolores (Ross) Harwood, residuary beneficiaries of

the Estate of Henry R. Walton, deceased, from Judith W. Davis the appointed executrix of the last will and testament of Henry R. Walton for a sum of $1.00.

NOTE: Apparently, Henry R. Walton maintained ownership of the property until his death on April 11, 1979. Title to the property was subsequently transferred to Judith W. Davis, E. Dolores Ross Harwood, H. Richard Walton and Janice Ackerman, beneficiaries of Henry Walton's last will and testament. On June 11, 1979, Ms. Ackerman resigned her claim to the property, leaving her portion to the other (residuary) beneficiaries.

May 15, 1985 - Property ownership is conveyed from Judith W. Davis, E. Delores Harwood and Henry Walton Jr. to Rudolph and Nancy Camishion for a sum of $190,000.

It should be noted a deed obtained at the Delran Township Tax Assessor's Office indicated Rudolph and Nancy Camishion sold the property to themselves on August 18, 1986. The purpose of such a transaction is unknown.

The nature of operations at the site prior to 1940 is unknown, however it is believed most, if not all of site activities centered around farming. No information was obtained during the investigation which would indicate the affiliations of the F.B. Lambert and Company and F.W. Tunnell Co. (both referenced in deed records) with the Waltons Farm site.

Apparently F.B. Lambert and Company was associated with the newspaper industry but their exact operations are unknown. Attempts to obtain additional information on the company from the New Jersey Department of State were unsuccessful.

The F.W. Tunnell Company was incorporated in Pennsylvania on July 7, 1910 for the manufacture and sale of glue, grease, fertilizers and similar materials. At the time of incorporation the stockholders and directors of the company were listed as Frederick W. Tunnell, Raymond W. Tunnell and Frederick Harold Tunnell. It should be noted the company's principal office was listed as 314 Market Street in Camden and Harvey F. Parr (same Camden address) was the corporate agent.

Waste disposal at the site allegedly (due to a lack of evidence, it cannot be determined if the site was used for disposal prior to Mr. Walton's ownership) began in the late 1930s or early 1940s with Mr. Walton's permission. Reportedly, all of the materials disposed at the site originated from a single facility (although operated by numerous industries) located on New Albany Road in Moorestown. It should be noted that this Moorestown facility, known as the Pulverizing Services site after its most recent occupant, is also a documented hazardous waste site. Recently the USEPA performed an immediate removal action at the Pulverizing Services site due to the large quantities of hazardous materials abandoned when Pulverizing Services ceased operations in Moorestown in 1979. In addition to Pulverizing Services, other industries known to have operated from the Moorestown facility (and possibly associated with waste disposal at Waltons Farm) include the American Pulverizing Co., Micronizer Processing Inc., Micronizer Company and Pittsburg Plate Glass (PPG). The operations of most of these companies were quite similar, involving the pulverizing

(processing) of a variety of chemicals into fine powders and, in some cases, blending chemicals with binding agents such as clay or talcum powder. Information pertaining to the history of the Moorestown facility was obtained from Mr. A.C. Hobbie, President of Pulverizing Services. Mr. Hobbie also served in a variety of capacities with other companies which formerly operated from the Moorestown site.

In the early 1930s, Norman Andrews and Asa M. Stackhouse founded the American Pulverizing Company with Mr. Andrews acting as the company president and Mr. Stackhouse as vice president. The exact operations of this company are unknown but apparently centered around the Micronizer Reduction Mill invented by Mr. Andrews. Sometime around 1935, the International Pulverizing Company became a subsidiary of the American Pulverizing Company. The company was subsequently divided in 1936 resulting in two separate entities, International Pulverizing Company and Micronizer Processing Inc. International Pulverizing was principally involved in research and development of the Micronizer Reduction Mill while Micronizer Processing Inc. pulverized sulfur for use in fungicides. The company principals of International Pulverizing and Micronizer Processing Inc. are unknown. Evidently, the American Pulverizing Company, International Pulverizing Company and Micronizer Processing Inc. never filed for (or received) certified corporate status from the New Jersey Department of State. It is unknown if any of these companies were incorporated in any other state.

In the early 1940s, Micronizer Processing Inc. expanded operations to include blending agricultural dust for various customers including PPG. The blending operations apparently involved mixing biocides including rotenone, calcium arsenate and pyretherum with binding agents such as clay and talcum powder. Between 1942 and 1947, Micronizer Processing Inc. began blending for companies including California Spray Chemical Co., Sherman (sic Sherwin) Williams, General Chemicals and DuPont. According to Mr. Hobbie, Micronizer Processing began blending DDT with talcum powder in 1946. The DDT was purchased from Merck or DuPont and after blending, was sold to the U.S. Military. Around this same time period, Micronizer Processing began custom processing a variety of chemicals including Sulfa Drugs for companies such as American Cyanamid. As previously stated, very little information is available concerning company principals and corporate status of American Pulverizing, International Pulverizing and Micronizer Processing Inc. However it is noted that Asa M. Stackhouse (under trust to the Burlington County Trust Company) is listed in the deed records for Waltons Farm dated November 3, 1938 and December 1, 1938. Mr. Stackhouse was also vice president of American Pulverizing. Apparently Mr. Stackhouse died prior to November 3, 1938, the exact date of his death is unknown.

The Moorestown facility was sold to the Freeport Sulfur (Sulphur) Company in 1947 and was operated under the name of the Micronizer Company. The corporate status and company principals for the Freeport Sulfur Co. and Micronizer Company for this time period is unknown. New Jersey Department of State records indicate the Freeport Sulfur Company was incorporated in Delaware on January 11, 1971 under the name Freeport Minerals Company. The company was authorized to conduct business in New Jersey on February 10, 1971. Because of the disparity between the date of incorporation (1971) and the date of operation at Moorestown (1947) it is difficult to determine if

these are the same (or affiliated) companies. No information on the Micronizer Company was obtained. It should be noted the status of Freeport Sulfur was withdrawn from New Jersey on November 29, 1979.

The Pittsburg Plate Glass Company (PPG) reportedly purchased the Moorestown facility from the Micronizer Company (Freeport Sulphur Co.) in 1949 and operated at the site until 1963. Again, little information is available concerning the corporate status and company principals for the time period in question. However, Mr. Hobbie reportedly acted as the Facility Manager and Senior Executive of PPG's Moorestown facility from the early 1950s to 1963. It is also noted that PPG was incorporated in Delaware on September 12, 1966 and was subsequently authorized to conduct business in New Jersey (date unknown). Although a disparity also exists between the date of incorporation (1966) and date of operation at Moorestown, PPG officials have readily admitted to their operations at Moorestown.

According to Mr. Hobbie, PPG operated from Moorestown as part of its Corona Chemical Division. PPG processed a variety of minerals, food products, pharmaceuticals, and agricultural products (including malathion and DDT) at the Moorestown facility. It has also been reported that burial of wastes at the Moorestown facility began during PPG's occupancy.

In 1963, PPG sold the Moorestown facility to Pulverizing Services, Inc. Pulverizing Services Inc. incorporated in New Jersey on November 6, 1963 to engage in a variety of functions including (but not limited to) manufacturing, compounding, refining, grinding, pulverizing, etc., chemicals of all kinds, and to deal in pesticides, fungicides and rodenticides. The original incorporators of Pulverizing Services included Alice P. Kern, Ruth B. Walker and Rose C. Valianti. Although Pulverizing Services is still listed as an active New Jersey Corporation, the company ceased operating in Moorestown (their only known facility in New Jersey) -in 1979. The company subsequently moved to Charleston, South Carolina where they conduct similar activities. As previously stated, the company abandoned much of their materials at the Moorestown facility requiring the EPA to perform immediate removal actions in 1988. According to Mr. Hobbie, the company did not have the financial capabilities to fund remediation at the Moorestown site.

Information obtained by NJDEP-DHWM, Central Bureau of Field Operations personnel during interviews with several employees of industries who occupied the Moorestown site indicated that waste disposal at Waltons Farm began sometime prior to 1945. During this time period, the American Pulverizing Company, International Pulverizing Company and Micronizer Processing Company operated at the Moorestown site and would be considered the waste generators. Apparently, Henry Walton was affiliated with these companies (possibly as an employee) and permitted the waste disposal at the farm. The wastes reportedly disposed included empty bags and containers as well as mill scraps from processing of DDT, sulfur, iron pyrites or whatever was being processed at that time. It should be noted that although Henry Walton owned the farm, his father Levi Walton actually farmed it.

In May of 1952 two fires were reported at the Walton Farm. Information obtained from the Delran Fire Department indicated the first fire occurred on May 23, 1952 and involved waste sulfur, chemicals and trash. The "Report of Fire" indicated the fire was set to burn (probably intentional) and was

suppressed with the use of water and brooms. Early the next day (May 24) a second fire was reported at the farm and again the materials involved included sulfur, chemicals and trash. It is probable this fire was the result of a resurgence of the May 23 fire. Subsequently, the Pittsburg Plate Glass Company, Corona Chemical Division donated $30.00 and a fire hose to the Delran Fire Department for their services at the Waltons Farm fire. A letter of thanks from the Delran Fire Department was addressed to Mr. Hobby (sic Hobbie), Plant Manager, PPG.

One of the former employees of the Moorestown facility interviewed by NJDEP personnel also stated a bulldozer was needed to help control the fire because the fire equipment was ineffective. According to this employee, the bulldozer covered the fire with dirt.

Allegedly, the use of the farm for disposal of wastes was discontinued after the fire(s). Accordingly, the companies which can be directly implicated with conditions at the farm (based on their operations at Moorestown) include the American Pulverizing Co., International Pulverizing Co., Micronizer Processing Inc., Micronizer Co. (Freeport Sulfur) and PPG.

Henry Walton maintained ownership of the property until his death in April of 1979 when the title was transferred to his beneficiaries includingE. Dolores Ross, Judith W. Davis, H. Richard Walton and Janice W. Ackerman. On June 11, 1979, Ms. Ackerman resigned her claim to the property leaving her portion (10%) to the residuary beneficiaries. In May of 1985, property ownership was transferred from the residuary beneficiaries to Rudolph and Nancy Camishion for $190,000.

The NJDEP was first informed of conditions at the site in June of 1986 by Robert Simkins, Burlington County Solid Waste Director. According to Mr. Simkins, he has little knowledge of the site but was actually relating information supplied to him by a local politician who wished to remain anonymous. Mr. Simkins stated the politician knew the driver who dumped at the farm and expressed concern that the dumping may present a hazard.

In response to Mr. Simkins' referral, the site was inspected by NJDEP personnel on June 12, 1986. During the inspection it was noted the dump site was roughly 50' x 50' in size and appeared to contain large quantities of sulfur. Much of the dump site was also void of vegetation. The site was situated adjacent to the mud flats of Rancocas Creek and erosional channels were observed leading from the dump to the creek.

On July 30, 1986, Dr. Rudolph Camishion contacted David Van Eck of the NJDEP claiming he was concerned his property may be a hazardous site. Dr. Camishion was interested in building a house on the property and wanted DEP approval the site was clean. It should be noted Dr. Camishion's first correspondence with the DEP concerning the site was more than a year after he acquired the property (and after DEP's initial inspection).

The NJDEP-DHWM, Bureau of Site Assessment completed a Preliminary Assessment (PA) for the site on August 1, 1986. A medium priority for further action was assigned citing potential surface water, soil and air contamination and the possible presence of pesticides and dioxin.

WF-1-3

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on, N.J. 08625-0028

(609)633-1408

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT

Michele M. Putnam
Deputy Director
Hazardous Waste Operations

John J. Trela, Ph.D., Director

Lance R. Miller
Deputy Director
Responsible Party Remedial Action

JAN 2 1990

RECEIVED
1/16/90

Stephen Luftig, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
26 Federal Plaza
New York, New York 10278

Dear Director Luftig:

Re: Removal Request - Walton's Farm
Creek Road
Delran Township, New Jersey

The New Jersey Department of Environmental Protection (NJDEP) hereby submits the Walton's Farm site for CERCLA removal action consideration. The following information details the case history and supports the removal request.

The Walton's Farm site is located off of Creek Road in a rural section of Delran Township, Burlington County. The farm was reportedly used for disposal of powdered chemicals, including pesticides, from the early 1940s to at least 1952 when dumping was allegedly discontinued following a fire which involved the aforementioned material. The farm itself, designated Block 119, Lot 16 on the current Delran tax map, encompasses 37.42 acres; however, the disposal area appears to comprise little more than 2,500 square feet. The disposal area is directly adjacent to wetlands associated with Rancocas Creek.

On October 28, 1986, the NJDEP, Central Bureau of Field Operations, investigated a complaint concerning a former pesticide chemical dump at the above referenced site. The investigation identified several potentially responsible parties and confirmed the presence of 4,4'DDT and its isomers at concentrations ranging from 170 ppm to 380,000 ppm through sampling and analysis of on-site soil.

On June 15, 1987, the Department issued an Administrative Order (Attachment 1) to the various responsible and potentially responsible parties. The Order requested the responsible and potentially responsible parties to determine the horizontal and vertical extent of contamination and to implement a remedial action plan.

Initially, the potential responsible parties agreed to prepare a sampling plan which would identify the horizontal and vertical extent of the landfill. Negotiations concerning particulars of the sampling plan have broken down. The Department has consistently maintained that sampling results must meet the deliverables format requirement as specified for the analytical method in SW-846, 3rd edition (Attachment 2).

A copy of the Department's Responsible Party Investigation Unit's, Investigative Summary is enclosed (Attachment 3).

The confirmed levels of pesticides in on-site soil and the reluctance of the responsible parties to take appropriate action have resulted in a situation which constitutes a significant threat to the local population via direct contact and potable ground water. Additionally, as the landfill lies adjacent to the Rancocas Creek and runoff from the landfill drains directly into the creek, it is recommended that the following activities be undertaken as part of a federally funded removal action:

(1) Determine the horizontal and vertical extent of the landfill.

(2) Installation of a fence and warning signs around the entire perimeter of the landfill.

(3) Sample and perform dioxin and full priority pollutant analysis to characterize the contents of the landfill.

(4) Install monitoring wells and perform a full priority pollutant analysis to determine the site's impact on ground water.

(5) Install drainage controls to prevent run-on and run-off from entering or leaving the landfill.

(6) Excavate and dispose of highly contaminated soils.

Should your staff require additional information, please have them contact Kenneth Kloo of the Bureau of Planning and Assessment at (609) 633-2219.

Very truly yours,

Lance R. Miller
Acting Director

KK:mz
Enclosures

c: Richard Salkie, USEPA (w/o enclosures)
Assistant Director Howitz, Hazardous Waste Enforcement Element (w/o enclosures)
Chief Krisak, Central Bureau of Field Operations (w/o enclosures)

JAN 7 199 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Removal Site Evaluation and Request for Removal Action Approval at the Walton's Farm Site, Delran Township, Burlington County, New Jersey - **ACTION MEMORANDUM**

Donald R. Graham, On-Scene Coordinator
Removal Action Branch

Richard L. Caspe, P.E., Director
Emergency and Remedial Response Division

Richard C. Salkie, Associate Director for
Removal and Emergency Preparedness Programs

I. ISSUE

The Walton's Farm site meets the criteria for a removal action under Section 300.415 of the National Contingency Plan (NCP) and is anticipated to require less than 12 months and $2 million for completion.

The proposed removal action at the Walton's Farm site will be accomplished in two phases. Phase I, currently under consideration for removal funding, is intended to isolate and identify hazardous materials landfilled at the site. Under Phase I, a fence will be erected and drainage controls will be installed to limit access to the site and prevent contaminated run-off from reaching the Rancocas Creek. In addition, an enhanced study will be conducted to determine extent of contamination and routes of contaminant migration. Upon completion of the enhanced study, an Action Memorandum will be written to request funding for the Phase II removal of the identified hazardous materials.

II. BACKGROUND

A. Site Description

1. Site location

Walton's Farm is located off Creek Road in a rural section of Delran Township, Burlington County, New Jersey. The farm is designated Block 119, Lot 16 on the Delran tax map and encompasses 37.42 acres. The dump site appears to consist of an approximately 100' x 200' area directly adjacent to the mud flats of Rancocas Creek; erosion channels lead from the dump to the creek. (See Figure 1, Appendix A, for site map).

RAB	RAB	ADREPP	ADNJP	ERR-DD	ORC:NJSUP	ERR
GRAHAM	ZACHOS	SALKIE	FRISCO	CALLAHAN	KARLEN	CASPE
6/28/90	6/28/90	6/28/90		12/24		1/7/91

Concur 9/11/91 F.C.

2. Site Characteristics

Walton's Farm was reportedly used for disposal of powdered chemicals, including pesticides, from sometime prior to 1945 until at least 1952, when a fire occurred at the dump site. Dumping supposedly stopped after the fire. However, debris indicates that the area was used or at least disturbed through the 1960s and into the 1970s.

3. National Priorities List (NPL) Status

Walton's Farm is not on the NPL.

B. Incident/Release Characteristics

Henry Walton allegedly permitted the disposal of empty bags and containers as well as mill scraps from processing DDT, Sulfur and Iron Pyrites on the 100' x 200' area of his farm. Evidence that environmental contamination has occurred at the site includes ground discoloration, stressed and lost vegetation, and debris. Weather conditions have exposed physical signs of the dumping and caused large amounts of the material to migrate.

C. Quantities and Types of Substances Present

On October 28, 1986 the New Jersey Department of Environmental Protection's (NJDEP's) Division of Hazardous Waste Management (DHWM) and Central Bureau of Field Operations collected five soil samples at the Walton's Farm landfill. All five samples contained DDT and tentatively identified DDT isomers. The concentrations of 4,4' DDT ranged from 170 ppm to 380,000 ppm. The tentatively identified DDT isomers ranged in concentration from 30 ppm to 340,000 ppm. Other pesticides detected included 4,4' DDD, 4,4' DDE, tentatively identified isomers of these compounds, alpha BHC, gamma BHC, endosulfan I, heptachlor epoxide and parathion (tentatively identified). In addition to pesticides, three samples contained arsenic ranging in concentration from 42 to 160 ppm. One sample contained thallium at a concentration of 23 ppm.

The NJDEP recommended action level for DDT in soil is 10 ppm. All five samples grossly exceeded this level. Concentrations of arsenic in three samples exceeded the NJDEP recommended action level of 20 ppm. One sample had concentrations of thallium above the NJDEP action level of 5 ppm.

The NJDEP data and the appropriate CERCLA statutory codes for selected hazardous substances detected are summarized in Table 1 of Appendix A.

one sample contained n-nitroso-diphenylamine at a concentration of 870 ppm. The NJDEP recommended soil action level for total base neutral extractables, including n-nitroso-diphenylamine, is only 10 ppm. The most significant issue presented by n-nitroso-diphenylamine is the inability of analytical methods to differentiate between it and diphenylamine, which is not carcinogenic.

D. Actions to Date

1. State and Local Actions to Date

The NJDEP became aware of the site in June of 1986, when Robert Simkins, the Burlington County Solid Waste Director, shared information given to him by a local politician. According to Mr. Simkins, the anonymous politician knew the driver who dumped at the farm.

NJDEP's Central Bureau of Field Operations inspected the site on October 28, 1986. Various colored substances were observed exposed on the soil surface. Five samples were collected and submitted for priority pollutant +40 analysis. A one-gallon brown glass Baker Analytical reagent bottle containing a clear liquid and labeled "containing benzene", was also forwarded to be analyzed for pesticides and PCBs.

Analysis of the samples showed the presence of excessive concentrations of pesticides and metals and lesser concentrations of semi-volatile and volatile organics. (See Table 1, Appendix A.)

NJDEP also inspected the site on February 10, 1989. At that time several questions regarding the dates of disposal at the site were raised.

2. Previous Actions to Abate Threat

In a letter from NJDEP dated January 2, 1987, the Camishions, present owners of Walton's Farm, were notified of the presence of the hazardous substances.

On January 6, 1987, the Central Bureau of Field Operations prepared an enforcement referral recommending a Directive be issued to the responsible and potentially responsible parties (PRP's) citing violations of N.J.S.A. 58:10-23.11c. A January 7, 1987 memorandum listed Rudolph and Nancy Camishion as responsible parties. PRP's include: Judith W. Davis (Nee Walton); the estate of Henry R. Walton; Pittsburgh Plate Glass

Co./Corona Chemical Division; DuPont de Nemours and Co./Grasselli Chemical Dept.; Hammond Bag and Paper Company; Ortho (California Spray Chemical Corp.); and Huber Chemical. Administrative Orders were issued to Rudolph and Nancy Camishion, Judith W. Davis, California spray Chemical Corp., in care of the Chevron Chemical Co.; the Pittsburgh Plate Glass Co., in care of the Corporation Trust Co.; the J.M. Huber Corporation and E.I. DuPont de Nemours and Co. on June 15, 1987. The Orders required each party to make a $11,428.50 reimbursement for public funds expended. In November of that year, the Camishions, claiming to be "innocent landowners," informed NJDEP that they were not willing to participate in the Administrative Order. Pittsburgh Plate Glass, E.I. DuPont de Nemours and Company, Chevron Chemical Corp. and J.M. Huber, submitted a joint proposal to perform a preliminary environmental investigation and implement security measures to restrict site access. Paul C. Rizzo Associates of Pittsburgh, Pa., submitted a Draft Sampling and Quality Assurance Plan for a preliminary site investigation. NJDEP's review of the draft plan revealed several deficiencies, among them the need for Tier I deliverables for all analyses. The responsible parties subsequently agreed to address the deficiencies with the exception of the need for Tier I deliverables.

Presently, disagreement over the type of deliverables needed has resulted in a breakdown of negotiations between NJDEP and the PRP's. As a result, the PRP's consultant (Paul C. Rizzo Associates) has not initiated an investigation of the site.

2. Current Actions to Abate Threat

In response to the NJDEP's request for a removal action, EPA personnel from the Removal Action Branch (RAB) visited the Walton's Farm site on January 26, 1990, to evaluate the potential for a removal action. As a result of this visit, a site investigation was initiated.

During the initial site visit, EPA's Technical Assistance Team (TAT) performed on-site analyses for chlorinated organics. Results confirmed the presence of chlorinated pesticides and served as a preliminary confirmation of NJDEP data.

Based on the presence of chlorinated pesticides and evidence that a fire had taken place at the disposal site, samples were collected to be analyzed for dioxins. Results of this analysis were forwarded to both the Agency for Toxic Substances and Disease Registry (ATSDR) and EPA's Dioxin Disposal Advisory Group (DDAG) for review. The RAB was subsequently informed that the site posed no dioxin based health threat or dioxin disposal considerations.

III. THREAT TO PUBLIC HEALTH OR WELFARE OF THE ENVIRONMENT

A. Threats to Public Health and Welfare

The high level of pesticides and other toxic substances in the soil present an unacceptable health risk to the population in the area. Many of the substances found thus far are known to be carcinogenic, teratogenic and mutagenic. Exposure pathways of concern include:

- Inhalation;
- Dermal absorption;
- Ingestion;
- Skin and/or eye contact.

A summary of the potential toxicological effects of substances found at Walton's Farm is presented in Figure 3 of Appendix A.

B. Threats to the Environment

Analyses conducted thus far indicate that soil contamination is extensive. Run-off from the site flows directly into Rancocas Creek; thereby spreading contamination.

The landfilled material may have an effect on aquatic and terrestrial biota near the site. Particularly, since many of the substances present are known bioaccumulation and biomagnification threats to the food chain. While any food chain contamination would threaten native wildlife, introduction of DDT could potentially devastate waterfowl which inhabit the Rancocas Creek wetlands.

IV. ENFORCEMENT

A. Enforcement Strategy

NJDEP maintained the lead on all enforcement matters until January 16, 1990, at which time the site was referred to the EPA for a potential removal action. All available PRP enforcement information was provided to EPA for further enforcement actions.

Currently, EPA is awaiting the PRP's reply to a general Notice Letter. Based upon a preliminary negotiations meeting it is anticipated that the PRP's reply will be favorable and an Administrative Consent Order (ACO) to perform the required mitigative action will be negotiated. Should the PRP fail to act in good faith as anticipated, RAB will undertake the mitigative actions described herein.

V. PROPOSED ACTIONS AND COSTS

A. Proposed Project

1. Descriptions of Proposed Actions

The proposed removal action will be completed in two phases. Phase I, presently under consideration for removal funding, includes securing the site, installing drainage controls and conducting an investigation to determine the nature and extent of contamination. By clearly defining the nature and extent of contamination prior to the initiation of Phase II, the removal and disposal of uncontaminated soils will be minimized and thus reduce the overall cost of remediation. Phase II of this project will address the removal and disposal of hazardous materials located on-site.

Securing the site will be accomplished by installing a six-foot, chain-link fence and warning signs around the perimeter of the site. The purpose of this action is to limit the threat to nearby residents and native wildlife from direct contact with hazardous materials located at or near the surface.

Drainage controls will consist of a deflection berm surrounding the area of contamination which is bounded by soil. This berm will prevent surface water from entering the landfill area and prevent contaminated run-off from reaching the Rancocas Creek. Additionally, sediment control devices (i.e., hay bales, silt fencing) will be installed along the embankment bordering the Rancocas Creek to further minimize the migration potential of contaminated materials. The purpose of this action is to limit the threat to sensitive ecosystems adjacent to the site posed by migration of contaminants through surface water.

The enhanced study will consist of two sampling rounds. The purpose of the first round is to characterize the contents of the landfill. Samples will be collected at 25-foot intervals and analyzed for pesticides and metals. Composite samples which are representative of the landfill as a whole will be prepared. These samples will be analyzed for disposal characteris tics.

The purpose of the second sampling round is to determine the boundaries of the landfill and the extent of migration of contaminants through soil. Results from the first sampling round

will be used to identify "target compounds". On-site screening for these "target compounds" will be the basis for defining the extent of contamination.

2. Contribution of Proposed Actions to Efficient Performance of Long-term Remedial Actions

The proposed actions will limit the migration of contaminants off-site and determine the extent of contamination for the Phase II removal of hazardous materials landfilled on-site.

3. Project Schedule

This project can be initiated within two weeks of the approval of this Action Memorandum. The time required for completion of this action is approximately two months. Upon completion of the enhanced study, an Action Memorandum will be written to request funding for the Phase II removal of hazardous materials landfilled at the site. The proposed mitigative tasks are detailed below and are shown on the project schedule diagram, Figure 2, in Appendix D.

a) Prepare Work Plan and Safety Plan
b) Erect fence and construct drainage controls
c) Sample and analyze hazardous materials to characterize landfill contents
d) Sample and analyze soils to determine extent of contamination

4. Alternative Actions

No alternative actions exist at this time. The hazardous material on-site must be removed and disposed of in an efficient, timely and proper manner. The fence and drainage controls erected according to this Action Memorandum will secure the site and limit further migration of contaminants until the hazardous material can be removed.

B. Estimated Site Budget

The estimated costs for completion of this project are summarized below, a detail cost estimate is provided in Appendix B.

1. EXTRAMURAL COSTS	
a. Mitigation Costs (ERCS)	$ 101,617
b. TAT Costs	$ 38,200
Extramural Direct Costs	$ 139,817

15% Contingency	20,973
c. TOTAL EXTRAMURAL COSTS	$ 160,790
2. INTRAMURAL COSTS	
a. Intramural Direct Costs	$ 13,200
b. Intramural Indirect Costs	40,000
c. TOTAL INTRAMURAL COSTS	$ 53,200
3. TOTAL PROJECT COST	$ 213,990
4. ROUNDED PROJECT COST	$ 214,000

VI. EXPECTED CHANGE IN SITUATION SHOULD NO ACTION BE TAKEN OR SHOULD ACTION BE DELAYED

If no immediate action is taken, contaminants will continue to migrate into the soil and surface water. A larger area of contamination and a longer, more costly cleanup will result. The existing threat to humans and the environment will increase.

VII. RECOMMENDATION

Approval of the proposed removal action as detailed and justified above, is recommended. The proposed removal action contributes to the efficient performance of any long-term remedial action at the site. Under 40 CFR 300.415 of the National Oil and Hazardous Substances Pollution Contingency Plan, a removal action is appropriate at this site due to the existence of:

1) Actual or potential exposure to hazardous substances, pollutants or contaminants by nearby populations, animals or food chain [300.415(b)(2)(i)];

2) High levels of hazardous substances, pollutants or contaminants in soils largely at or near the surface that may migrate [300.415(b)(2)(iv)];

3) Weather conditions that may cause hazardous substances, pollutants or contaminants to migrate or be released [300.415(b)(2)(v)];

4) The availability of other appropriate Federal or State response mechanisms to respond to the release [300.415(b)(2)(vii)], and

5) Other situations or factors which may pose threats to public health or welfare or the environment [300.65(b)(2)(viii)].

The estimated project ceiling of the Walton's Farm site Removal Funding Request is $214,000 of which $101,617 is for mitigation contracting.

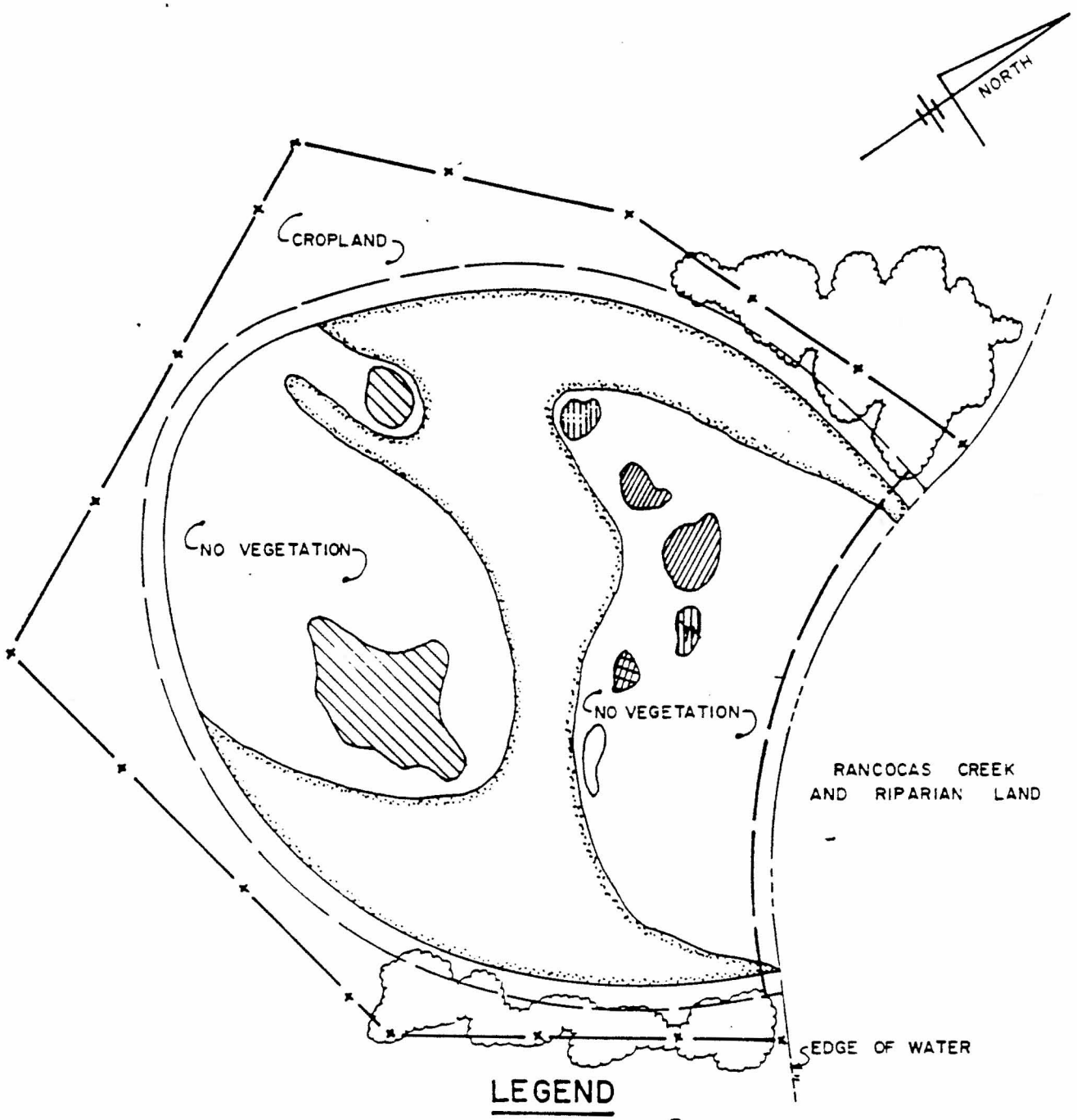
Your authority to approve this request is established by Administrator Lee Thomas' Interim Delegation 14-1-A of September 21, 1987.

Sufficient funding is available in our current Advice of Allowance to fund this project.

Approved:_____ Date:_____
Richard L. Caspe, P.E., Director
Emergency and Remedial Response Division

Disapproved:_____ Date:_____
Richard L. Caspe, P.E., Director
Emergency and Remedial Response Division

cc: (after approval is obtained)
C. Sidamon-Eristoff, RA
R. Caspe, ERR
R. Salkie, ERR-ADREPP
G. Zachos, ERR-RAB
J. Frisco, ERR-ADNJP
J. Marshall, OEP
R. Borsellino, ERR-NJRAB
R. Gherardi, OPM-FIN
D. Karlen, ORC-NJSUP.
T. Mignone, TATL
T. Grier, OS-210
L. Guarneiri, OS-210
N. Robinson, ERR-NJCB
P. Hick, ORC-NJSUP
K. Weaver, OPM-FIN
L. Miller, NJDEP
W. Skacel, NJDEP
S. Luftig, OS-210
J. Rosianski, OEP
C. Moyik, ERRD-PS
D. Henne, TATL
K. Weaver, OPM-FAM



LEGEND

- WHITE & BROWN SUBSTANCES BURNT PIECES OF WOOD
- WHITE SUBSTANCES
- PURPLE SUBSTANCES
- YELLOW SUBSTANCES
- LT. BROWN SUBSTANCES
- INDIAN GRASS
- TREES
- PROPOSED FENCE
- PROPOSED EROSION CONTROL BARRIER
- PROPOSED BERM

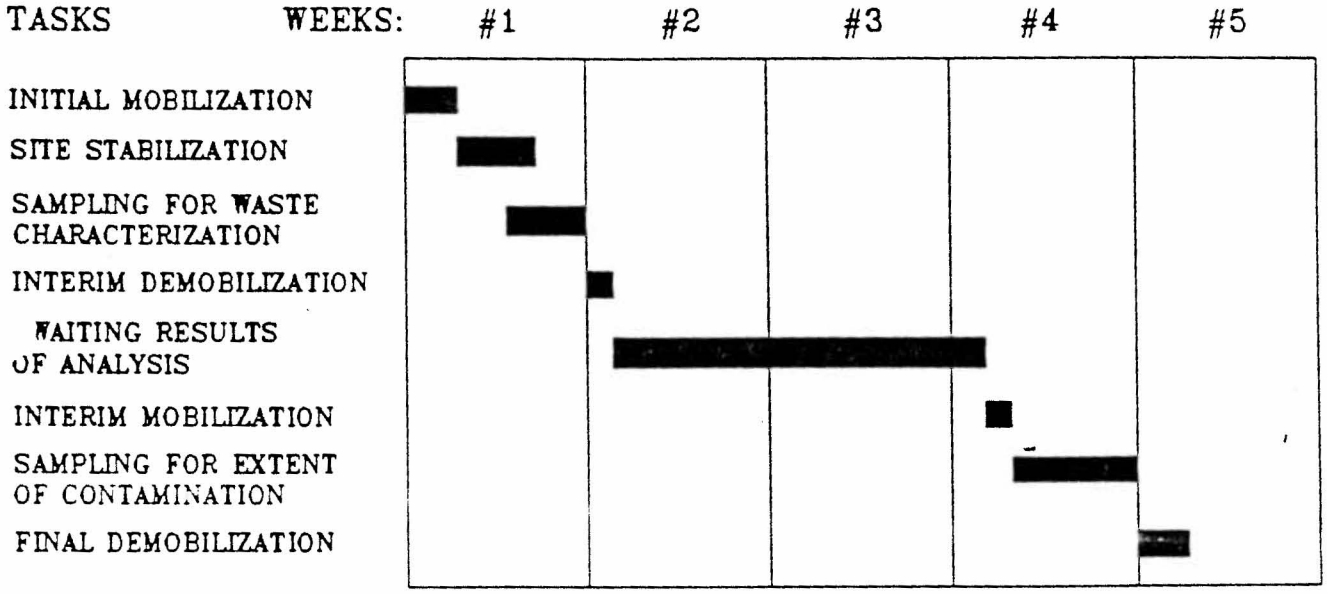
DWN. BY: DR
DATE: 05-25-90
DWN. # 2737A

REVISED: 06-22-90
REVISED: 06-15-90
DWN. NOT TO SCALE

WESTON — SPILL PREVENTION & EMERGENCY RESPONSE	EPA PM: D. Graham	Walton's Farm Site Map
In Association with ICF Technology Inc., C.C. Johnson & Malhotra, P.C., Resource Applications, Inc. and R.E. Sarriera Associates	TAT PM: E. Wilson	Figure 1

WALTON'S FARM SITE

PHASE I – PROJECT SCHEDULE



DWN. BY: DR
DWN. #2737
DATE:06-30-90

WESTON	SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM D. Graham	Figure 2
In association with ICF, Inc Jacobs Engineering, Inc. & Tetra Tech, Inc		TAT PM E. Wilson	Project Schedule

WALTON'S FARM

Summary of Potential Toxicological
Effects of Selected Identified Compounds

	1. CARCINOGENIC	2. TERATOGENIC	3. MUTAGENIC	4. TOXIC BY INHALATION, INGESTION, OR DERMAL CONTACT	5. CENTRAL NERVOUS SYSTEM EFFECTS	6. EYE, SKIN, RESPIRATORY OR MUCOUS MEMBRANE IRRITANT	7. LIVER DAMAGE	8. KIDNEY DAMAGE	9. CARDIOVASCULAR DAMAGE
4,4" DDT	X			X	X	X	X	X	
DDE				X					
DDD				X					
Alpha BHC	X		X						
Gamma BHC	X			X	X	X	X	X	X
Sulfur						X			
Heptachloroepoxide				X	X		X		
Endosulfan I				X	X	X			
Parathion				X	X	X			X
Arsenic				X		X	X	X	
Thallium				X	X	X	X	X	

TABLE 1

ANALYSIS OF SOIL SAMPLES COLLECTED BY NJDEP

Contaminant	Concentration Detected (mg/kg)	CERCLA Statutory Codes
N-nitroso-diphenylamine	870**	2
alpha BHC	2,900	2
gamma BHC	2,600	1,2,4
4,4'-DDD	1,800	1,2,4
DDD Isomer	200,000*	1,2,4
4,4'-DDE	(1,500)	2
DDE Isomer	16,000*	2
4,4'-DDT	380,000	1,2,4
DDT Isomer	93,200*	1,2,4
Endosufan I	3,700	1,2,4
Heptachlor Epoxide	(10)	2
Parathion	12*	1
Unknown Substituted Benzene	69*	--
Arsenic	160	2,3
Thallium	23	2
Phenolics, as phenol	11	1,2,4

* Tentatively identified during non-target compound library search.

** Analytical methods do not differentiate between this compound and the more acutely toxic compound, diphenylamine.

( ) Estimated value, compound detected below Method Detection Limit.

1 Indicates that the statutory source for designation of this hazardous substance under CERCLA is Clean Water Act Section 311(b)(4).

2 Indicates that the statutory source for designation of this hazardous substance under CERCLA is Clean Water Act Section 307(a).

3 Indicates that the statutory source for designation of this hazardous substance under CERCLA is Clean Air Act Section 112.

4 Indicates that the statutory source for designation of this hazardous substance under CERCLA is RCRA Section 3001.

Appendix B

Additional Information

Relating to this Section

Can be Found in the

Confidential Files

(Pages 16, 17, 18)
found in 1.21 ©

NJ DEP Analysis
Wallens Farm

S-R ANALYTICAL INC.

IV. Analytical Results

Priority Pollutant Analyses

Volatile Organics

		Sample Designation		
Constituent	Method Blank	SR13301-1 WSO 41	SR13301-2 WSO 42	SR13301-3 WSO 43
Chloromethane	10U	14U	11U	15U
Bromomethane	10U	14U	11U	15U
Vinyl Chloride	10U	14U	11U	15U
Chloroethane	10U	14U	11U	15U
Methylene Chloride*	10U	70	15	310
1,1-Dichloroethene	10U	14U	11U	15U
1,1-Dichloroethane	10U	14U	11U	15U
trans-1,2-Dichloroethene	10U	14U	11U	15U
Chloroform	10U	14U	11U	15U
1,2-Dichloroethane	10U	14U	11U	15U
1,1,1-Trichloroethane	10U	14U	11U	15U
Carbon Tetrachloride	10U	14U	11U	15U
Bromodichloromethane	10U	14U	11U	15U
1,2-Dichloropropane	10U	14U	11U	15U
trans-1,3-Dichloropropene	10U	14U	11U	15U
Trichloroethene	10U	14U	11U	15U
Dibromochloromethane	10U	14U	11U	15U
1,1,2-Trichloroethane	10U	14U	11U	15U
Benzene	10U	14U	11U	15U
cis-1,3-Dichloropropene	10U	14U	11U	15U
2-Chloroethyl Vinyl Ether	10U	14U	11U	15U
Bromoform	10U	14U	11U	15U
Tetrachloroethene	10U	14U	11U	15U
1,1,2,2-Tetrachloroethane	10U	14U	11U	15U
Toluene*	10U	14U	11U	15U
Chlorobenzene	10U	14U	11U	15U
Ethyl Benzene	10U	14U	11U	15U
Units	(ug/l)	(ug/kg)	(ug/kg)	(ug/kg)

*Identification of these compounds at low levels is sometimes attributed to laboratory contamination.

U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

IV. Analytical Results (CONT'D)

Volatile Organics

Constituent	Sample Designation SR13301-4 WSO 44	SR13301-5 WSO 45	SR13301-7 Field Blank
Chloromethane	14U	12U	10U
Bromomethane	14U	12U	10U
Vinyl Chloride	14U	12U	10U
Chloroethane	14U	12U	10U
Methylene Chloride*	700	620	10U
1,1-Dichloroethene	14U	12U	10U
1,1-Dichloroethane	14U	12U	10U
trans-1,2-Dichloroethene	14U	12U	10U
Chloroform	14U	12U	10U
1,2-Dichloroethane	14U	12U	10U
1,1,1-Trichloroethane	14U	12U	10U
Carbon Tetrachloride	14U	12U	10U
Bromodichloromethane	14U	12U	10U
1,2-Dichloropropane	14U	12U	10U
trans-1,3-Dichloropropene	14U	12U	10U
Trichloroethene	14U	12U	10U
Dibromochloromethane	14U	12U	10U
1,1,2-Trichloroethane	14U	12U	10U
Benzene	14U	12U	10U
cis-1,3-Dichloropropene	14U	12U	10U
2-Chloroethyl Vinyl Ether	14U	12U	10U
Bromoform	14U	12U	10U
Tetrachloroethene	14U	12U	10U
1,1,2,2-Tetrachloroethane	14U	12U	10U
Toluene*	14U	12U	10U
Chlorobenzene	14U	12U	10U
Ethyl Benzene	14U	12U	10U
Units	(ug/kg)	(ug/kg)	(ug/kg)

*Identification of these compounds at low levels is sometimes attributed to laboratory contamination.

U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

IV. Analytical Results (CONT'D)

Semivolatile Organics by GC/MS (Page 1 of 2)

		Sample Designation		
Constituent	Method Blank	SR13301-1 WSO 41	SR13301-2 WSO 42	SR13301-3 WSO 43
Phenol	330U	13,000U	11,000U	14,000U
bis(2-Chloroethyl) Ether	330U	13,000U	11,000U	14,000U
2-Chlorophenol	330U	13,000U	11,000U	14,000U
1,3-Dichlorobenzene	330U	13,000U	11,000U	14,000U
1,4-Dichlorobenzene	330U	13,000U	11,000U	14,000U
Benzyl Alcohol	330U	13,000U	11,000U	14,000U
1,2.-Dichlorobenzene	330U	13,000U	11,000U	14,000U
2-Methylphenol	330U	13,000U	11,000U	14,000U
bis(2-Chloroisopropyl) Ether	330U	13,000U	11,000U	14,000U
4-Methylphenol	330U	13,000U	11,000U	14,000U
N-Nitroso-dipropylamine	330U	13,000U	11,000U	14,000U
Hexachloroethane	330U	13,000U	11,000U	14,000U
Nitrobenzene	330U	13,000U	11,000U	14,000U
Isophorone	330U	13,000U	11,000U	14,000U
2-Nitrophenol	330U	13,000U	11,000U	14,000U
2,4-Dimethylphenol	330U	13,000U	11,000U	14,000U
Benzoic Acid	1,600U	65,000U	52,000U	70,000U
bis(2-Chloroethoxy)methane	330U	13,000U	11,000U	14,000U
2,4-Dichlorophenol	330U	13,000U	11,000U	14,000U
1,2,4-Trichlorobenzene	330U	13,000U	11,000U	14,000U
Naphthalene	330U	13,000U	65J	14,000U
4-Chloroaniline	330U	13,000U	11,000U	14,000U
Hexachlorobutadiene	330U	13,000U	11,000U	14,000U
4-Chloro-3-methylphenol	330U	13,000U	11,000U	14,000U
2-Methylnaphthalene	330U	13,000U	11,000U	14,000U
Hexachlorocyclopentadiene	330U	13,000U	11,000U	14,000U
2,4,6-Trichlorophenol	330U	13,000U	11,000U	14,000U
2,4,5-Trichlorophenol	1,600U	65,000U	52,000U	70,000U
2-Chloronaphthalene	330U	13,000U	11,000U	14,000U
2-Nitroaniline	1,600U	65,000U	52,000U	70,000U
Dimethyl Phthalate	330U	13,000U	11,000U	14,000U
Acenaphthylene	330U	13,000U	11,000U	14,000U
3-Nitroaniline	1,600U	65,000U	52,000U	70,000U
Acenaphthene	330U	13,000U	11,000U	14,000U
2,4-Dinitrophenol	1,600U	65,000U	52,000U	70,000U
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)

Note: Identification of phthalates at low levels is sometimes attributed to laboratory contamination.

J - Constituent detected but below the MDL. Quantitation is approximate.

U - Compound was analyzed for but not detected. The number is the minimum

IV. Analytical Results (CONT'D)

Semivolatile Organics by GC/MS (Page 2 of 2)

Constituent	Method Blank	Sample Designation SR13301-1 WSO 41	SR13301-2 WSO 42	SR13301-3 WSO 43
4-Nitrophenol	1,600U	65,000U	52,000U	70,000U
Dibenzofuran	330U	13,000U	11,000U	14,000U
2,4-Dinitrotoluene	330U	13,000U	11,000U	14,000U
2,6-Dinitrotoluene	330U	13,000U	11,000U	14,000U
Diethyl Phthalate	330U	13,000U	11,000U	14,000U
4-Chlorophenyl Phenyl Ether	330U	13,000U	11,000U	14,000U
Fluorene	330U	13,000U	11,000U	14,000U
4-Nitroaniline	1,600U	65,000U	52,000U	70,000U
4,6-Dinitro-2-methylphenol	1,600U	65,000U	52,000U	70,000U
N-nitrosodiphenylamine	330U	13,000U	11,000U	14,000U
4-Bromophenyl Phenyl Ether	330U	13,000U	11,000U	14,000U
Hexachlorobenzene	330U	13,000U	11,000U	14,000U
Pentachlorophenol	1,600U	65,000U	52,000U	70,000U
Phenanthrene	330U	13,000U	11,000U	14,000U
Anthracene	330U	13,000U	11,000U	14,000U
Di-n-butyl Phthalate	330U	13,000U	11,000U	870J
Fluoranthene	330U	13,000U	11,000U	14,000U
Pyrene	330U	13,000U	11,000U	14,000U
Butyl Benzyl Phthalate	330U	13,000U	11,000U	14,000U
3,3'-Dichlorobenzidine	660U	27,000U	22,000U	29,000U
Benzo(a)anthracene	330U	13,000U	11,000U	14,000U
bis(2-Ethylhexyl) Phthalate	330U	1,100J	11,000U	14,000U
Chrysene	330U	13,000U	11,000U	14,000U
Di-n-octyl Phthalate	330U	13,000U	11,000U	14,000U
Benzo(b)fluoranthene	330U	13,000U	11,000U	14,000U
Benzo(k)fluoranthene	330U	13,000U	11,000U	14,000U
Benzo(a)pyrene	330U	13,000U	11,000U	14,000U
Indeno(1,2,3-cd)pyrene	330U	13,000U	11,000U	14,000U
Dibenzo(a,h)anthracene	330U	13,000U	11,000U	14,000U
Benzo(g,h,i)perylene	330U	13,000U	11,000U	14,000U
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)

Note: Identification of phthalates at low levels is sometimes attributed to laboratory contamination.

J - Constituent detected but below the MDL. Quantitation is approximate.

U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

V. Analytical Results (CONT'D)

Semivolatile Organics by GC/MS (Page 1 of 2)

Constituent	Sample Designation SR13301-4 WSO 44	SR13301-5 WSO 45	SR13301-7 Field Blank
Phenol	13,000U	11,000U	10U
bis(2-Chloroethyl) Ether	13,000U	11,000U	10U
2-Chlorophenol	13,000U	11,000U	10U
1,3-Dichlorobenzene	13,000U	11,000U	10U
1,4-Dichlorobenzene	13,000U	11,000U	10U
Benzyl Alcohol	13,000U	11,000U	10U
1,2,-Dichlorobenzene	13,000U	11,000U	10U
2-Methylphenol	13,000U	11,000U	10U
bis(2-Chloroisopropyl) Ether	13,000U	11,000U	10U
4-Methylphenol	13,000U	11,000U	10U
N-Nitroso-dipropylamine	13,000U	11,000U	10U
Hexachloroethane	13,000U	11,000U	10U
Nitrobenzene	13,000U	11,000U	10U
Isophorone	13,000U	11,000U	10U
2-Nitrophenol	13,000U	11,000U	10U
2,4-Dimethylphenol	13,000U	11,000U	10U
Benzoic Acid	65,000U	53,000U	10U
bis(2-Chloroethoxy)methane	13,000U	11,000U	10U
2,4-Dichlorophenol	13,000U	11,000U	10U
1,2,4-Trichlorobenzene	13,000U	11,000U	10U
Naphthalene	13,000U	11,000U	10U
4-Chloroaniline	13,000U	11,000U	10U
Hexachlorobutadiene	13,000U	11,000U	10U
4-Chloro-3-methylphenol	13,000U	11,000U	10U
2-Methylnaphthalene	13,000U	11,000U	10U
Hexachlorocyclopentadiene	13,000U	11,000U	10U
2,4,6-Trichlorophenol	13,000U	11,000U	10U
2,4,5-Trichlorophenol	65,000U	53,000U	10U
2-Chloronaphthalene	13,000U	11,000U	10U
2-Nitroaniline	65,000U	53,000U	10U
Dimethyl Phthalate	13,000U	11,000U	10U
Acenaphthylene	13,000U	11,000U	10U
3-Nitroaniline	65,000U	53,000U	10U
Acenaphthene	13,000U	11,000U	10U
2,4-Dinitrophenol	65,000U	53,000U	10U
Units	(ug/kg)	(ug/kg)	(ug/l)

Note: Identification of phthalates at low levels is sometimes attributed to laboratory contamination.

U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

IV. Analytical Results (CONT'D)

Semivolatile Organics by GC/MS (Page 2 of 2)

	Sample Designation		
Constituent	SR13301-4 WSO 44	SR13301-5 WSO 45	SR13301-7 Field Blank
4-Nitrophenol	65,000U	53,000U	50U
Dibenzofuran	13,000U	11,000U	10U
2,4-Dinitrotoluene	13,000U	11,000U	10U
2,6-Dinitrotoluene	13,000U	11,000U	10U
Diethyl Phthalate	13,000U	11,000U	10U
4-Chlorophenyl Phenyl Ether	13,000U	11,000U	10U
Fluorene	13,000U	11,000U	10U
4-Nitroaniline	65,000U	53,000U	50U
4,6-Dinitro-2-methylphenol	65,000U	53,000U	50U
N-nitrosodiphenylamine	13,000U	870,000	10U
4-Bromophenyl Phenyl Ether	13,000U	11,000U	10U
Hexachlorobenzene	13,000U	11,000U	10U
Pentachlorophenol	65,000U	53,000U	50U
Phenanthrene	13,000U	11,000U	10U
Anthracene	13,000U	11,000U	10U
Di-n-butyl Phthalate	13,000U	11,000U	10U
Fluoranthene	13,000U	11,000U	10U
Pyrene	13,000U	11,000U	10U
Butyl Benzyl Phthalate	13,000U	11,000U	10U
3,3'-Dichlorobenzidine	27,000U	22,000U	20U
Benzo(a)anthracene	13,000U	11,000U	10U
bis(2-Ethylhexyl) Phthalate	13,000U	11,000U	11
Chrysene	13,000U	11,000U	10U
Di-n-octyl Phthalate	13,000U	11,000U	10U
Benzo(b)fluoranthene	13,000U	11,000U	10U
Benzo(k)fluoranthene	13,000U	11,000U	10U
Benzo(a)pyrene	13,000U	11,000U	10U
Indeno(1,2,3-cd)pyrene	13,000U	11,000U	10U
Dibenzo(a,h)anthracene	13,000U	11,000U	10U
Benzo(g,h,i)perylene	13,000U	11,000U	10U
Units	(ug/kg)	(ug/kg)	(ug/l)

Note: Identification of phthalates at low levels is sometimes attributed to laboratory contamination.

U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

IV. Analytical Results (CONT'D)

EPA/NIH/NBS Nontargetted Library Search

Sample Designation SR13301-1

Client Designation WSO 41

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (ug/kg)
	None Detected	VOA	--	--
	Unknown Compound	BNA	614	22,000B
56-38-2	Parathion	BNA	1,854	12,000
	DDD Isomer	BNA	2,093	69,000
	DDT Isomer	BNA	2,105	30,000
	DDT Isomer	BNA	2,170	70,000
	Unknown Compound	BNA	2,777	9,600

B: Estimated concentration is calculated against the nearest eluting internal standard.

7. Analytical Results (CONT'D)

EPA/NIH/NBS Nontargetted Library Search

Sample Designation SR13301-2

Client Designation WSO 42

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (ug/kg)
	None Detected	VOA	--	--
	DDD Isomer	BNA	2,092	52,000
	Unknown Compound	BNA	1,866	29,000

Note: Estimated concentration is calculated against the nearest eluting internal standard.

V. Analytical Results (CONT'D)

EPA/NIH/NBS Nontargetted Library Search

Sample Designation SR13301-3

Client Designation WSO 43

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (ug/kg)
	None Detected	VOA	--	--
	Unknown Substituted Benzene	BNA	728	69,000
	Unknown Compound	BNA	1.401	130,000
	Unknown Compound	BNA	1.579	280,000
	DDMU Isomer	BNA	1.919	230,000
	DDMU Isomer	BNA	1.960	300,000
	DDD Isomer	BNA	2.037	1,800,000
	Unknown Compound	BNA	2.064	960,000
	DDD Isomer	BNA	2,097	6,600,000
	DDT Isomer	BNA	2.108	8,800,000
	DDD Isomer	BNA	2.135	420,000
	DDT Isomer	BNA	2.178	14,000,000 J
	Unknown Compound	BNA	2.491	270,000
	Unknown Compound	BNA	2,927	1,000

J: Estimated concentration is calculated against the nearest eluting internal standard.

V. Analytical Results (CONT'D)

EPA/NIH/NBS Nontargetted Library Search

Sample Designation SR13301-4

Client Designation WSO 44

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (ug/kg)
	None Detected	VOA	--	--
	Unknown Compound	BNA	1.252	750,000
	Unknown Compound	BNA	1,316	1,400,000
	Unknown Compound	BNA	1.405	5,000,000
	Unknown Compound	BNA	1.526	1,900,000
	Unknown Compound	BNA	1.585	8,000,000
	DDMU Isomer	BNA	1.924	3,200,000
	DDE Isomer	BNA	1.974	16,000,000
	Unknown Compound	BNA	1,996	13,000,000
	DDE Isomer	BNA	2.023	90,000,000
	DDD Isomer	BNA	2.042	47,000,000
	DDD Isomer	BNA	2.102	200,000,000
	DDT Isomer	BNA	2.114	340,000,000
	DDT Isomer	BNA	2.139	16,000,000
	DDT Isomer	BNA	2.186	340,000,000
	Unknown Compound	BNA	2.500	9,100,000
			1,091,2	1,091,350,000

Estimated concentration is calculated against the nearest eluting internal standard.

Analytical Results (CONT'D)

EPA/NIH/NBS Nontargetted Library Search

Sample Designation SR13301 S

Client Designation WSO 45

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (ug/kg)
	None Detected	VOA	--	--
	Unknown Compound	BNA	1,945	130,000,000
	DDD Isomer	BNA	2,097	6,800,000

* Estimated concentration is calculated against the nearest eluting internal standard.

IV. Analytical Results (CONT'D)

Pesticidal Compounds and Polychlorinated Biphenyls

		Sample Designation		
Constituent	Method Blank	SR13301-1 WSO 41	SR13301-2 WSO 42	SR13301-3 WSO 43
Aldrin	10U	45,000U	36,000U	4,800,000U
alpha BHC	10U	45,000U	36,000U	41,000J
beta BHC	10U	45,000U	36,000U	4,800,000U
gamma BHC	10U	550J	600J	4,800,000U
delta BHC	10U	45,000U	36,000U	4,800,000U
Chlordane	10U	45,000U	36,000U	4,800,000U
Dieldrin	10U	45,000U	36,000U	4,800,000U
4,4'-DDE	10U	14,000J	12,000J	64,000J
4,4'-DDD	10U	25,000J	11,000J	1,500,000J
4,4'-DDT	10U	360,000	170,000	12,000,000
Endosulfan I	10U	45,000U	36,000U	4,800,000U
Endosulfan II	10U	45,000U	36,000U	4,800,000U
Endosulfan Sulfate	10U	45,000U	36,000U	4,800,000U
Endrin	10U	45,000U	36,000U	4,800,000U
Endrin Aldehyde	10U	45,000U	36,000U	4,800,000U
Heptachlor	10U	45,000U	36,000U	4,800,000U
Heptachlor Epoxide	10U	10,000J	36,000U	4,800,000U
Toxaphene	10U	45,000U	36,000U	4,800,000U
Aroclor 1016	10U	45,000U	36,000U	4,800,000U
Aroclor 1221	10U	45,000U	36,000U	4,800,000U
Aroclor 1232	10U	45,000U	36,000U	4,800,000U
Aroclor 1242	10U	45,000U	36,000U	4,800,000U
Aroclor 1248	10U	45,000U	36,000U	4,800,000U
Aroclor 1254	10U	45,000U	36,000U	4,800,000U
Aroclor 1260	10U	45,000U	36,000U	4,800,000U
Units	(ug/l)	(ug/kg)	(ug/kg)	(ug/kg)

Note: All compounds reported at levels exceeding the detection limit have been confirmed by either alternate column GC or by GC/MS.

U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

IV. Analytical Results (CONT'D)

Pesticidal Compounds and Polychlorinated Biphenyls

	Sample Designation	
Constituent	SR13301-4 WSO 44	SR13301-5 WSO 45
Aldrin	450,000U	400,000U
alpha BHC	450,000U	2,900,000
beta BHC	450,000U	400,000U
gamma BHC	450,000U	2,600,000
delta BHC	450,000U	400,000U
Chlordane	450,000U	400,000U
Dieldrin	450,000U	400,000U
4,4'-DDE	1,800,000	100,000J
4,4'-DDD	450,000U	250,000J
4,4'-DDT	380,000,000	3,500,000
Endosulfan I	3,700,000	400,000U
Endosulfan II	450,000U	400,000U
Endosulfan Sulfate	450,000U	400,000U
Endrin	450,000U	400,000U
Endrin Aldehyde	450,000U	400,000U
Heptachlor	450,000U	400,000U
Heptachlor Epoxide	450,000U	400,000U
Toxaphene	450,000U	400,000U
Aroclor 1016	450,000U	400,000U
Aroclor 1221	450,000U	400,000U
Aroclor 1232	450,000U	400,000U
Aroclor 1242	450,000U	400,000U
Aroclor 1248	450,000U	400,000U
Aroclor 1254	450,000U	400,000U
Aroclor 1260	450,000U	400,000U
Units	(ug/kg)	(ug/kg)

1.477×10^{3}

Note: All compounds reported at levels exceeding the detection limit have been confirmed by either alternate column GC or by GC/MS.

U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

IV. Analytical Results (CONT'D)

Pesticidal Compounds and Polychlorinated Biphenyls

	Sample Designation
Constituent	SR13301-6 WSO 46
Aldrin	1,000U
alpha BHC	1,000U
beta BHC	1,000U
gamma BHC	1,000U
delta BHC	1,000U
Chlordane	1,000U
Dieldrin	1,000U
4,4'-DDE	1,000U
4,4'-DDD	1,000U
4,4'-DDT	1,000U
Endosulfan I	1,000U
Endosulfan II	1,000U
Endosulfan Sulfate	1,000U
Endrin	1,000U
Endrin Aldehyde	1,000U
Heptachlor	1,000U
Heptachlor Epoxide	1,000U
Toxaphene	1,000U
Aroclor 1016	1,000U
Aroclor 1221	1,000U
Aroclor 1232	1,000U
Aroclor 1242	1,000U
Aroclor 1248	1,000U
Aroclor 1254	1,000U
Aroclor 1260	1,000U
Units	(ug/l)

Note: All compounds reported at levels exceeding the detection limit have been confirmed by either alternate column GC or by GC/MS.

U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

IV. Analytical Results (CONT'D)

Metals, Cyanide and Phenolics

Parameter	Method Blank	Sample Designation SR13301-1 WSO 41	SR13301-2 WSO 42	SR13301-3 WSO 43
Antimony, total	6,000U	8,200U	6,600U	8,800U
Arsenic, total	5,000U	42,000	5,500U	6,000U
Beryllium, total	500U	680U	550U	740U
Cadmium, total	1,000U	1,400U	1,100U	1,500U
Chromium, total	5,000U	6,800U	5,500U	7,400U
Copper, total	2,500U	7,900	9,900	16,000
Lead, total	10,000U	200,000	11,000U	220,000
Mercury, total	200U	340	220U	290U
Nickel, total	4,000U	5,500U	4,400U	5,900U
Selenium, total	1,000U	1,400U	1,100U	1,500U
Silver, total	5,000U	6,800U	5,500U	7,400U
Thallium, total	10,000U	23,000	11,000U	5,000U
Zinc, total	4,000U	32,000	4,300J	3,500
Cyanide, total	250U	340U	270U	360U
Phenolics, total, as phenol	250U	340	1,500	11,000
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)

Parameter	Sample Designation SR13301-4 WSO 44	SR13301-5 WSO 45
Antimony, total	8,200U	7,300U
Arsenic, total	130,000	160,000
Beryllium, total	680U	180J
Cadmium, total	1,400U	1,200U
Chromium, total	6,800U	2,000
Copper, total	160,000	21,000
Lead, total	18,000	100,000
Mercury, total	270U	270
Nickel, total	3,200J	4,900U
Selenium, total	2,300	1,200U
Silver, total	6,800U	6,100U
Thallium, total	14,000U	3,700U
Zinc, total	23,000	17,000
Cyanide, total	340U	300U
Phenolics, total, as phenol	5,800	2,600
Units	(ug/kg)	(ug/kg)

J - Constituent detected but below the MDL. Quantitation is approximate.

U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

SOUTHWEST RESEARCH INSTITUTE

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April 11, 1990

USEPA Region II ESD
Woodbridge Ave. Bldg. 209
Edison, New Jersey 08837

Attention: Mr. Richard Spear

Subject: SAS 5301B, Contract Lab Program
Sample, Standards and Raw QC Data Packages
Contract 68-D9-0057
SwRI Project 01-2999

Gentlemen:

Enclosed are the dioxin analysis data for the above-referenced case.

Sincerely,

Jo Ann Boyd

Jo Ann Boyd
Research Technologist/
Sample Management

TECHNICAL APPROVAL:

Jong-Pyng Hsu, Manager
Organics Analysis Laboratory

cc: Sample Management Office (includes Sample Data Summary)
Environmental Monitoring Systems Lab, Las Vegas
J. P. Hsu

Contract: 68-D9-0057
April 11, 1990
First SDG: 5301B-01
Last SDG: 53011B-16

CASE NARRATIVE
SwRI
SAS 5301B
SDG 5301B-01

- 15 SOIL SAMPLES FOR DIOXIN ANALYSIS: 5301B-01, 02, 03, 04, 07, 08, 09, 10, 11, 12, 13, 14, 16, ONE RINSATE 5301B-15.
- Confirmation analysis: 02, 04, 06, 10, 12, 13,
- MS/MSD: 16
- Samples received March 26, 1990 for a 14 day verbal 21 day hardcopy from receipt of last sample at the lab.
- Method performed was by attached SAS solicitation.

DIOXIN ANALYSIS

1. In the initial calibration standard CC1, the RRF of 1234678-HpCDD is 0.523, which is much lower than the RRF's of other calibration standards. This RRF is considered outlier and is not included in the calculation of mean RRF and %RSD for HpCDD. Concentration of CC1 is 0.1 ug/ml which is equivalent to 10 ppt for one liter of water sample; this is five times lower than the estimated detection limits for the method. Therefore, the deletion of the RRF of 1234678-HpCDD in CC1 does not deteriorate the quality of the data.

2. An unknown compound, (m/z 340, 342, 356 and 358), eluting at 1174 second interferes with 12378-PeCDD (m/z 356 and 358) which elutes at 1171 second. It is found in the lab blanks that the peak areas of m/z 342 and 358 of the interfering compound are about the same. Therefore, the peak area of m/z 356 of 12378-PeCDD is estimated according to the following equation:

$$\text{Area of m/z 356} = \frac{(\text{Area of m/z 358} - \text{Area of m/z 342})}{0.66}$$

The ratio of 0.66 is the theoretical ratio of m/z 358/356. The estimated area of m/z 356 is then used in the calculation of RRF for 12378-PeCDD in CC2, CC1 and CC3 of the initial calibration standards.

The septa bleeding of the GC was found to be the source of interference. This problem has been corrected and shows no interference encountered on m/z 356 in the analysis of 5301B samples.

3. Sample 5301B-15, a TCE rinsate sample, was blown down to near dryness and underwent a clean-up process. No extraction was performed on this sample.

4. Up to 30% of DDT, DDE, Sulfur, etc. were found in sample 5301B-03, -04, -05, -06, -08, and -10. The large amount of interfering compounds made the cleanup process very difficult. Although most of internal standard recoveries are within QC limits, some of them are outside the QC limits and are believed to be due, in part, to the interfering compounds.

5. The m/z 320 of 2378-TCDD on Quadrex 007 column which was used for 2378-TCDD confirmation also interfered. This caused the ratio of m/z 320/322 to be out of the required window. However, the presence of m/z 257 undoubtedly confirms the existence of 2378-TCDD in some of the PE samples (i.e. 5301B-12 and 5301B-13). Attempted confirmation of 2378-TCDD for 5301B-10 was unsuccessful. Attempted confirmation of 2378-TCDF for 5301B-02, -04, -06, and -10 was also unsuccessful.

6. The quantitation and D.L. calculation were done manually and recorded on MIDMASS Chromatograms.

7. All samples are spiked with 1.0 ml of IS mixture containing the following compounds before extraction:

^{13}C-2378-TCDD	56 ng/ml
^{13}C-123678-HxCDD	54 ng/ml
^{13}C-OCDD	98 ng/ml
^{13}C-2378-TCDF	46 ng/ml
^{13}C-1234678-HpCDF	52 ng/ml

All samples are spiked with 10 ul of recovery standard mixture consisting of the following compounds before GC/MS analysis:

^{13}C-1234-TCDD	5.6 ng/ul
^{13}C-123789-HxCDD	4.8 ng/ul

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature."

Dr. J.-P. Hsu, Manager
Organics Laboratory Analysis

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-01

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5304B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP020

Sample wt/vol: 10.75 (g/mL) g Lab File ID: 60401008

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2114

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.04
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.03
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.05
123678 HxCDD	NA			
123789 HxCDD	NA			1
Total HxCDD		1		
HEPTA				
1234678 HpCDD	NA	ND		0.08
Total HpCDD		ND		
OCTA				
Total OCDD	NA	0.98		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
126%	107%	99%

U 002

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-01

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP020

Sample wt/vol: 10.75 (g/mL) g Lab File ID: 60401008

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2114

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.01
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.03
23478 PeCDF	NA			0.03
Total PeCDF				
HEXA				
123478 HxCDF	NA	ND		0.03
123678 HxCDF	NA			"
123789 HxCDF	NA			"
234678 HxCDF	NA			0.06
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	ND		0.11
1234789 HpCDF	NA			0.18
Total HpCDF				
OCTA				
Total OCDF	NA	1.2		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
124%	97%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-02

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP021

Sample wt/vol: 10.47 (g/mL) g Lab File ID: 6040102

Instrument ID: HNN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1455

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ~~ug/L~~ ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.12
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.02
Total PeCDD		ND		
HEXA				0.13 (JCA) ~~0.02~~
123478 HxCDD	NA	ND		
123678 HxCDD	NA			
123789 HxCDD	NA			1
Total HxCDD		0.23		
HEPTA				
1234678 HpCDD	NA	0.49		NA
Total HpCDD		1.56		
OCTA				
Total OCDD	NA	2.7		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
107%	86%	66%

0 004

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

Lab Name: SwRI	Contract: 68-D9-0057
Lab Code: SwRI	Case No.: ____ SAS No.: 530/B Batch: ____
Matrix: Soil (Sludge/Still/Ash/Soil/Water)	Lab Sample ID: SP021
Sample wt/vol: 10.47 (g/mL) g	Lab File ID: 6040/002
Instrument ID: FINN6	Date Received: 3-26-90
GC Column ID: DB-5	Date Extracted: 3-26-90
Water Sample Prep.: NA (Sepf/Cont)	Date Analyzed: 4-1-90
Extract Prep.: KD (RV/KD)	Time Analyzed: 1455
Extract Volume: 100 (uL)	Dilution Factor: 1
Injection Volume: 2 (uL)	

5316-02

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.074
Total TCDF		0.141		
PENTA				
12378 PeCDF	NA	ND		0.01
23478 PeCDF	NA	ND		0.01
Total PeCDF		0.041		
HEXA				
123478 HxCDF	NA	ND		0.02
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	0.076		NA
1234789 HpCDF	NA	ND		0.10
Total HpCDF		0.076		
OCTA				
Total OCDF	NA	0.41		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
94%	59%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO. 5301B-03

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP022

Sample wt/vol: 10.32 (g/mL) g Lab File ID: 60331011

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2307

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.22
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.31
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.61
123678 HxCDD	NA			0.61
123789 HxCDD	NA			0.61
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		1.85
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.50

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
117%	78%	130%

0 006

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-03

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP022

Sample wt/vol: 10.32 (g/mL) g Lab File ID: 60331011

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2307

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.13
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.27
23478 PeCDF	NA	1		0.27
Total PeCDF		1		
HEXA				
123478 HxCDF	NA	ND		0.57
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF		1		1
HEPTA				
1234678 HpCDF	NA	ND		1.43
1234789 HpCDF	NA	1		1.43
Total HpCDF				
OCTA				
Total OCDF	NA	ND		0.20

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
118%	67%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-04

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP023

Sample wt/vol: 10.58 (g/mL) g Lab File ID: 6040003

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1536

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.4 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.20
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.34
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.22
123678 HxCDD	NA			I
123789 HxCDD	NA			
Total HxCDD		I		
HEPTA				
1234678 HpCDD	NA	ND		0.33
Total HpCDD		ND		
OCTA				
Total OCDD	NA	2.92		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
83%	89%	106%

0 008

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-04

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: _____ (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP023

Sample wt/vol: 10.58 (g/mL) g Lab File ID: 60401003

Instrument ID: HANG Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1536

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.4 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.79
Total TCDF		0.27		
PENTA				
12378 PeCDF	NA	ND		0.22
23478 PeCDF	NA	1		0.22
Total PeCDF		1		
HEXA				
123478 HxCDF	NA	ND		0.20
123678 HxCDF	NA	1		1
123789 HxCDF	NA	1		1
234678 HxCDF	NA	1		0.40
Total HxCDF		1		
HEPTA				
1234678 HpCDF	NA	ND		0.20
1234789 HpCDF	NA	1		0.20
Total HpCDF		1		
OCTA				
Total OCDF	NA	0.86		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
64%	91%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO. 5301B-05

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP024

Sample wt/vol: 10.75 (g/mL) g Lab File ID: 60601005

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 6-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1834

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.6 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.25
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.24
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.28
123678 HxCDD	NA			1
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.23
Total HpCDD		ND		
OCTA				
Total OCDD	NA	3.6		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
52 %	86 %	96 %

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO. 0 010

Lab Name: SwRI	Contract: 68-D9-0057	5301B-05	
Lab Code: SwRI	Case No.:	SAS No.: 5301B	Batch:
Matrix: Soil (Sludge/Still/Ash/Soil/Water)		Lab Sample ID: SP024	
Sample wt/vol: 10.75 (g/mL) g		Lab File ID: 60401005	
Instrument ID: FINN6		Date Received: 3-26-90	
GC Column ID: DB-5		Date Extracted: 3-26-90	
Water Sample Prep.: NA (Sepf/Cont)		Date Analyzed: 4-1-90	
Extract Prep.: KD (RV/KD)		Time Analyzed: 1834	
Extract Volume: 200 (uL)		Dilution Factor: 1	
Injection Volume: 1.6 (uL)			

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.21
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.30
23478 PeCDF	NA	I		0.30
Total PeCDF		I		
HEXA				
123478 HxCDF	NA	ND		0.15
123678 HxCDF	NA			I
123789 HxCDF	NA			
234678 HxCDF	NA			0.30
Total HxCDF		I		
HEPTA				
1234678 HpCDF	NA	ND		0.17
1234789 HpCDF	NA	I		0.13
Total HpCDF		I		
OCTA				
Total OCDF	NA	1.43		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
37%	94%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

53018-06

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP025

Sample wt/vol: 10.66 (g/mL) g Lab File ID: 6060/004

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1621

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.4 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.07
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.32
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.30
123678 HxCDD	NA			
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.35
Total HpCDD		ND		
OCTA				
Total OCDD	NA	9.1		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
64%	82%	39%

0 012

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-06

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP025

Sample wt/vol: 10.66 (g/mL) g Lab File ID: 60601004

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 6-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1621

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.4 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.29
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.22
23478 PeCDF	NA	"		0.22
Total PeCDF		"		
HEXA				
123478 HxCDF	NA	ND		0.21
123678 HxCDF	NA	"		"
123789 HxCDF	NA	"		"
234678 HxCDF	NA	"		"
Total HxCDF		"		
HEPTA				
1234678 HpCDF	NA	ND		0.93
1234789 HpCDF	NA	"		0.20
Total HpCDF		"		
OCTA				
Total OCDF	NA	10.4		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
49%	83%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-07

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP026

Sample wt/vol: 13.64 (g/mL) g Lab File ID: 60331010

Instrument ID: ZINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2233

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.04
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.09
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.06
123678 HxCDD	NA			
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.18
Total HpCDD		ND		
OCTA				
Total OCDD	NA	1.6		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
114%	99%	113%

0 014
EPA SAMPLE NO.

1DFB
PCDF SAMPLE DATA SUMMARY

Lab Name: SwRI	Contract: 68-D9-0057	5301B-07
Lab Code: SwRI	Case No.:	SAS No.: 5301B	Batch:
Matrix: Soil (Sludge/Still/Ash/Soil/Water)		Lab Sample ID: SP026
Sample wt/vol: 13.64 (g/mL) g		Lab File ID: 60331010
Instrument ID: HP5N6		Date Received: 3-26-90
GC Column ID: DB-5		Date Extracted: 3-26-90
Water Sample Prep.: NA (Sepf/Cont)		Date Analyzed: 3-31-90
Extract Prep.: KD (RV/KD)		Time Analyzed: 2233
Extract Volume: 100 (uL)		Dilution Factor: 1
Injection Volume: 2 (uL)		

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	0.043		NA
Total TCDF		0.088		
PENTA				
12378 PeCDF	NA	ND		0.02
23478 PeCDF	NA	ND		0.02
Total PeCDF		ND		
HEXA				
123478 HxCDF	NA	ND		0.06
123678 HxCDF	NA	"		"
123789 HxCDF	NA	"		"
234678 HxCDF	NA	"		"
Total HxCDF		"		
HEPTA				
1234678 HpCDF	NA	ND		0.16
1234789 HpCDF	NA	"		0.16
Total HpCDF		"		
OCTA				
Total OCDF	NA	2.25		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
115%	88%

0 015

EPA SAMPLE NO.

1DFA
PCDD SAMPLE DATA SUMMARY

5301B-08

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP027

Sample wt/vol: 11.05 (g/mL) g Lab File ID: 60331012

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2347

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.02
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.03
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.04
123678 HxCDD	NA			
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	0.09		NA
Total HpCDD		0.16		
OCTA				
Total OCDD	NA	26		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
121 %	90 %	127 %

0 013

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-08

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP027

Sample wt/vol: 11.05 (g/mL) g Lab File ID: 6033012

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2347

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.03
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.02
23478 PeCDF	NA	ND		0.02
Total PeCDF		0.03		
HEXA				
123478 HxCDF	NA	ND		0.01
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF		0.39		
HEPTA				
1234678 HpCDF	NA	0.45		NA
1234789 HpCDF	NA	ND		0.02
Total HpCDF		1.71		
OCTA				
Total OCDF	NA	7.6		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
115%	89%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-09

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP02B

Sample wt/vol: 10.62 (g/mL) g Lab File ID: 6033I013

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 0020

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.01
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.05
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.065
123678 HxCDD	NA			
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.25
Total HpCDD		ND		
OCTA				
Total OCDD	NA	0.38		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
107%	99%	165%

0 013

1DFB

PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-09

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP038

Sample wt/vol: 10.62 (g/mL) g Lab File ID: 60331013

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 0020

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	0.033		NA
Total TCDF		0.180		
PENTA				
12378 PeCDF	NA	ND		0.034
23478 PeCDF	NA			0.024
Total PeCDF				
HEXA				
123478 HxCDF	NA	ND		0.087
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	ND		0.069
1234789 HpCDF	NA			0.069
Total HpCDF				
OCTA				
Total OCDF	NA	0.29		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
95%	104%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.: 5301B-10

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP029

Sample wt/vol: 10.91 (g/mL) g Lab File ID: 6040021

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1416

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.25
Total TCDD		#1.77		
PENTA				
12378 PeCDD	NA	0.46		NA
Total PeCDD		3.18		
HEXA				
123478 HxCDD	NA	0.36		NA
123678 HxCDD	NA	0.98		1
123789 HxCDD	NA	1.08		
Total HxCDD		4.83		
HEPTA				
1234678 HpCDD	NA	2.24		NA
Total HpCDD		3.33		
OCTA				
Total OCDD	NA	9.76		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
92%	93%	62%

0 0020

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-10

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: _____ Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP029

Sample wt/vol: 10.91 (g/mL) g Lab File ID: 6040L001

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1416

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.021
Total TCDF		3.81		
PENTA				
12378 PeCDF	NA	0.62		NA
23478 PeCDF	NA	0.41		NA
Total PeCDF		2.05		
HEXA				
123478 HxCDF	NA	0.82		NA
123678 HxCDF	NA	0.40		
123789 HxCDF	NA	0.58		
234678 HxCDF	NA	0.93		
Total HxCDF		3.31		
HEPTA				
1234678 HpCDF	NA	1.50		NA
1234789 HpCDF	NA	2.52		NA
Total HpCDF		4.27		
OCTA				
Total OCDF	NA	9.72		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
80%	62%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

S301B-11

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: S301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: S3376-11 SPIKE

Sample wt/vol: 10.78 (g/mL) g Lab File ID: 60401006

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1913

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.6 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.19
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.38
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.18
123678 HxCDD	NA			0.18
123789 HxCDD	NA			0.18
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	0.46		NA
Total HpCDD		0.81		
OCTA				
Total OCDD	NA	9.7		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
60%	80%	111%

U 022

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-11

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: Spc30

Sample wt/vol: 10.78 (g/mL) g Lab File ID: 60401006

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1913

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.6 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.39
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND	-	0.24
23478 PeCDF	NA			0.24
Total PeCDF				
HEXA				
123478 HxCDF	NA	ND		0.22
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF				
HEPTA		(JCl)		
1234678 HpCDF	NA	~~ND~~ 0.90		~~0.42~~ NA
1234789 HpCDF	NA	ND		0.42
Total HpCDF		~~ND~~ 0.90		
OCTA				
Total OCDF	NA	10		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
47%	87%

0 023

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-12

Lab Name: SwRI Contract: 68-D4-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: SAND (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP031

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331004

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1658

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	3.0		NA
Total TCDD		7.4		
PENTA				
12378 PeCDD	NA	ND		0.09
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.15
123678 HxCDD	NA			1
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.17
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.12

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
114%	101%	112%

0 024

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5304B-12

ab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: SAND (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP031

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331004

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1850

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.04
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.06
23478 PeCDF	NA			0.06
Total PeCDF				
HEXA				
123478 HxCDF	NA	ND		0.14
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	ND		0.35
1234789 HpCDF	NA			0.35
Total HpCDF				
OCTA				
Total OCDF	NA	ND		0.17

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
108%	82%

0 025

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-13

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sind (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP432

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331005

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1937

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	1.7		NA
Total TCDD		3.3		
PENTA				
12378 PeCDD	NA	ND		0.05
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.03
123678 HxCDD	NA			"
123789 HxCDD	NA			"
Total HxCDD		"		
HEPTA				
1234678 HpCDD	NA	ND 0.02 (JCP)		0.08
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.04

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
119%	106%	107%

0 026

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.: 5301B-13

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP032

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331005

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1937

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.01
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.01
23478 PeCDF	NA			0.01
Total PeCDF				
HEXA				
123478 HxCDF	NA	ND		0.03
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	ND		0.06
1234789 HpCDF	NA			0.06
Total HpCDF				
OCTA				
Total OCDF	NA	ND		0.02

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
108%	97%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-14

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP033

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331006

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2011 (GC)

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.05
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.17
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.11
123678 HxCDD	NA			1
123789 HxCDD	NA			
Total HxCDD		1		
HEPTA				
1234678 HpCDD	NA	ND		0.25
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.25

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
110%	105%	114%

0 028

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-14

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SB033

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331006

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2011

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.03
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.05
23478 PeCDF	NA	"		0.05
Total PeCDF		"		
HEXA				
123478 HxCDF	NA	ND		0.14
123678 HxCDF	NA	"		"
123789 HxCDF	NA	"		"
234678 HxCDF	NA	"		"
Total HxCDF		"		
HEPTA				
1234678 HpCDF	NA	ND		0.11
1234789 HpCDF	NA	"		0.11
Total HpCDF		"		
OCTA				
Total OCDF	NA	ND		0.21

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
110%	80%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.
5301B-15

Lab Name: SwRI Contract: 68-79-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Solvent (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP034

Sample wt/vol: 160 (g/mL) mL Lab File ID: 60331003

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: NA (RV/KD) Time Analyzed: 1819

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.005
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.009
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.013
123678 HxCDD	NA			0.013
123789 HxCDD	NA			0.013
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.020
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.012

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
92%	103%	134%

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.: 00030

5301B-15

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Solvent (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP034

Sample wt/vol: 160 (g/mL) mL Lab File ID: 60331003

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: NA (RV/KD) Time Analyzed: 1819

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.001
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.004
23478 PeCDF	NA	ND		0.004
Total PeCDF		ND		
HEXA				
123478 HxCDF	NA	ND		0.013
123678 HxCDF	NA			0.013
123789 HxCDF	NA			0.013
234678 HxCDF	NA			0.013
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	ND		0.013
1234789 HpCDF	NA			0.013
Total HpCDF				
OCTA				
Total OCDF	NA	ND		0.007

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
106%	96%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

Solid Method Blk

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5304B Batch: _____

Matrix: Na2SO4 (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SMB (3-26-90)

Sample wt/vol: 10 (g/mL) g Lab File ID: 6033l001

Instrument ID: FINN6 Date Received: NA

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1633

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.07
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.08
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.15
123678 HxCDD	NA			
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.07
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.29

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
107%	105%	91%

1DFB
PCDF SAMPLE DATA SUMMARY

0 032
EPA SAMPLE NO.

Solid Method Blk

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: (H2SO4 (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SMB (3-26-90)

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331001

Instrument ID: FINN6 Date Received: NA

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1633

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg g

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.01
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.05
23478 PeCDF	NA	"		0.05
Total PeCDF		"		
HEXA				
123478 HxCDF	NA	ND		0.12
123678 HxCDF	NA	"		"
123789 HxCDF	NA	"		"
234678 HxCDF	NA	"		"
Total HxCDF		"		
HEPTA				
1234678 HpCDF	NA	ND		0.20
1234789 HpCDF	NA	"		0.20
Total HpCDF		"		
OCTA				
Total OCDF	NA	ND		0.16

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
106%	82%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

Solid Method Blk

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 1301B Batch: _____

Matrix: H_2SO_4 (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SMB(3/27/90)

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331002

Instrument ID: FINN6 Date Received: NA

GC Column ID: DB-5 Date Extracted: 3/27/90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3/31/90

Extract Prep.: KD (RV/KD) Time Analyzed: 1212

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg (ppb)

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.06
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.07
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.15
123678 HxCDD	NA			1
123789 HxCDD	NA			
Total HxCDD		1		
HEPTA				
1234678 HpCDD	NA	ND		0.18
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.25

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
105%	107%	133%

0 034

EPA SAMPLE NO.

1DFB

PCDF SAMPLE DATA SUMMARY

Solid Method Blk

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Na2SO4 (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SMB (3-27-90)

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331002

Instrument ID: FINN6 Date Received: NA

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1712

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/g (ppb)

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.36
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.07
23478 PeCDF	NA	1		0.07
Total PeCDF		1		
HEXA				
123478 HxCDF	NA	ND		0.13
123678 HxCDF	NA	1		1
123789 HxCDF	NA	1		1
234678 HxCDF	NA	1		1
Total HxCDF		1		
HEPTA				
1234678 HpCDF	NA	ND		0.17
1234789 HpCDF	NA	1		0.17
Total HpCDF		1		
OCTA				
Total OCDF	NA	ND		0.13

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
100%	96%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.
5301B-16 MS

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SF035

Sample wt/vol: 10 (g/mL) g Lab File ID: 6033007

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2042

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg / g

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	5.5		NA
Total TCDD		5.5		
PENTA				
12378 PeCDD	NA	5.2		NA
Total PeCDD		5.2		
HEXA				
123478 HxCDD	NA	ND		0.13
123678 HxCDD	NA	44		NA
123789 HxCDD	NA	ND		0.13
Total HxCDD		44		
HEPTA				
1234678 HpCDD	NA	47		NA
Total HpCDD		47		
OCTA				
Total OCDD	NA	8.6		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
116%	107%	111%

0 036

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

530B-16MS

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 530B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP035

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331007

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2042

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	44		NA
Total TCDF		44		
PENTA				
12378 PeCDF	NA	4.9		NA
23478 PeCDF	NA	~~4.9~~ ND		0.01
Total PeCDF		4.9		
HEXA				
123478 HxCDF	NA	ND		0.03
123678 HxCDF	NA	5.2		NA
123789 HxCDF	NA	ND		0.03
234678 HxCDF	NA	ND		0.03
Total HxCDF		5.2		
HEPTA				
1234678 HpCDF	NA	5.3		NA
1234789 HpCDF	NA	ND		0.13
Total HpCDF		5.3		
OCTA				
Total OCDF	NA	7.6		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
107%	94%

0 0

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-16 MSD

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP036

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331008

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2123

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	5.5		NA
Total TCDD		5.5		
PENTA				
12378 PeCDD	NA	5.0		NA
Total PeCDD		5.0		
HEXA				
123478 HxCDD	NA	ND		0.10
123678 HxCDD	NA	4.6		NA
123789 HxCDD	NA	ND		0.10
Total HxCDD		4.6		
HEPTA				
1234678 HpCDD	NA	6.1		NA
Total HpCDD		6.1		
OCTA				
Total OCDD	NA	9.2		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
120%	97%	138%

0 038

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-16 MSD

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP036

Sample wt/vol: 10 (g/mL) g Lab File ID: 6033008

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2123

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	44		NA
Total TCDF		44		
PENTA				
12378 PeCDF	NA	47		NA
23478 PeCDF	NA	ND		0.02
Total PeCDF		47		
HEXA				
123478 HxCDF	NA	ND		0.08
123678 HxCDF	NA	4.8		NA
123789 HxCDF	NA	ND		0.08
234678 HxCDF	NA	ND		0.08
Total HxCDF		48		
HEPTA				
1234678 HpCDF	NA	5.4		NA
1234789 HpCDF	NA	ND		0.15
Total HpCDF		5.4		
OCTA				
Total OCDF	NA	7.4		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
119%	86%

U 180

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-01

Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 534B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP020

Sample wt/vol: 10.75 (g/mL) g Lab File ID: 60401008

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2114

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg g

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.04
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.03
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.05
123678 HxCDD	NA			
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.08
Total HpCDD		ND		
OCTA				
Total OCDD	NA	0.98		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
126%	107%	99%

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.: 5301B-01

Lab Name: SwRI Contract: 68-D9-0057

Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP020

Sample wt/vol: 10.75 (g/mL) g Lab File ID: 60401008

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2114

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.01
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.03
23478 PeCDF	NA	1		0.03
Total PeCDF		1		
HEXA				
123478 HxCDF	NA	ND		0.03
123678 HxCDF	NA	"		1
123789 HxCDF	NA	"		"
234678 HxCDF	NA	"		0.06
Total HxCDF		1		
HEPTA				
1234678 HpCDF	NA	ND		0.11
1234789 HpCDF	NA	1		0.18
Total HpCDF		1		
OCTA				
Total OCDF	NA	1.2		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
124%	97%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.: 5301B-02

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP021

Sample wt/vol: 10.47 (g/mL) g Lab File ID: 6040/002

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1455

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.12
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.02
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.13 (ICP) ~~0.02~~
123678 HxCDD	NA	"		"
123789 HxCDD	NA	"		"
Total HxCDD		0.23		
HEPTA				
1234678 HpCDD	NA	0.49		NA
Total HpCDD		4.56		
OCTA				
Total OCDD	NA	2.7		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
107%	86%	66%

0 202

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

Name: SwRI	Contract: 68-D9-0057
Lab Code: SwRI	Case No.: ____ SAS No.: 5301B Batch: ____
Matrix: Soil (Sludge/Still/Ash/Soil/Water)	Lab Sample ID: SP021
Sample wt/vol: 10.47 (g/mL) g	Lab File ID: 6040/002
Instrument ID: FINN6	Date Received: 3-26-90
GC Column ID: DB-5	Date Extracted: 3-26-90
Water Sample Prep.: NA (Sepf/Cont)	Date Analyzed: 4-1-90
Extract Prep.: KD (RV/KD)	Time Analyzed: 1455
Extract Volume: 100 (uL)	Dilution Factor: 1
Injection Volume: 2 (uL)	

5301B-02

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.074
Total TCDF		0.141		
PENTA				
12378 PeCDF	NA	ND		0.01
23478 PeCDF	NA	ND		0.01
Total PeCDF		0.041		
HEXA				
123478 HxCDF	NA	ND		0.02
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	0.076		NA
1234789 HpCDF	NA	ND		1.10
Total HpCDF		0.076		
OCTA				
Total OCDF	NA	0.41		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
94%	59%

U 225

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-03

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP022

Sample wt/vol: 10.32 (g/mL) g Lab File ID: 60331011

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2307

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.22
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.31
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.61
123678 HxCDD	NA			0.61
123789 HxCDD	NA			0.61
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		1.85
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.50

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
117%	78%	130%

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO. 5301B-03

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP022

Sample wt/vol: 10.32 (g/mL) g Lab File ID: 60331011

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2307

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.13
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.27
23478 PeCDF	NA	"		0.27
Total PeCDF		"		
HEXA				
123478 HxCDF	NA	ND		0.57
123678 HxCDF	NA	"		"
123789 HxCDF	NA	"		"
234678 HxCDF	NA	"		"
Total HxCDF		"		
HEPTA				
1234678 HpCDF	NA	ND		1.43
1234789 HpCDF	NA	"		1.43
Total HpCDF		"		
OCTA				
Total OCDF	NA	ND		0.20

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
118%	67%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-04

b Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP023

Sample wt/vol: 10.58 (g/mL) g Lab File ID: 6040003

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1536

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.4 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.20
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.34
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.22
123678 HxCDD	NA			"
123789 HxCDD	NA			"
Total HxCDD		"		
HEPTA				
1234678 HpCDD	NA	ND		0.33
Total HpCDD		ND		
OCTA				
Total OCDD	NA	2.2		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
83%	89%	106%

U 247

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-04

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: _____ (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP023

Sample wt/vol: 10.58 (g/mL) g Lab File ID: 60401003

Instrument ID: HP5N6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1536

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.4 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.79
Total TCDF		0.27		
PENTA				
12378 PeCDF	NA	ND		- 0.22
23478 PeCDF	NA			0.22
Total PeCDF				
HEXA				
123478 HxCDF	NA	ND		0.20
123678 HxCDF	NA				
123789 HxCDF	NA				
234678 HxCDF	NA			0.40
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	ND		0.20
1234789 HpCDF	NA			0.20
Total HpCDF				
OCTA				
Total OCDF	NA	0.86		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
64%	91%

0 272

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-05

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP024

Sample wt/vol: 10.75 (g/mL) g Lab File ID: 60401005

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1834

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.6 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.25
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.24
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.28
123678 HxCDD	NA			1
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.23
Total HpCDD		ND		
OCTA				
Total OCDD	NA	3.6		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
52 %	86 %	96 %

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO. 0273

b Name: SwRI	Contract: 68-D8-0057
Lab Code: SwRI	Case No.: ____ SAS No.: 5301B Batch: ____
Matrix: Soil (Sludge/Still/Ash/Soil/Water)	Lab Sample ID: SP024
Sample wt/vol: 10.75 (g/mL) g	Lab File ID: 60401005
Instrument ID: FINN6	Date Received: 3-26-90
GC Column ID: DB-5	Date Extracted: 3-26-90
Water Sample Prep.: NA (Sepf/Cont)	Date Analyzed: 4-1-90
Extract Prep.: KD (RV/KD)	Time Analyzed: 1834
Extract Volume: 200 (uL)	Dilution Factor: 1
Injection Volume: 1.6 (uL)	

5301B-05

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.21
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.30
23478 PeCDF	NA			0.30
Total PeCDF				
HEXA				
123478 HxCDF	NA	ND		0.15
123678 HxCDF	NA				
123789 HxCDF	NA				
234678 HxCDF	NA			0.30
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	ND		0.17
1234789 HpCDF	NA			0.13
Total HpCDF				
OCTA				
Total OCDF	NA	1.43		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
37%	94%

0 292

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-06

Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP025

Sample wt/vol: 10.66 (g/mL) g Lab File ID: 6060/004

Instrument ID: FINN 6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1621

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.4 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.07
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.32
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.30
123678 HxCDD	NA			1
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.35
Total HpCDD		ND		
OCTA				
Total OCDD	NA	9.1		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
64%	82%	39%

U 293

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-06

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP025

Sample wt/vol: 10.66 (g/mL) g Lab File ID: 6040/004

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1621

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.4 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.29
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.22
23478 PeCDF	NA	⊥		0.22
Total PeCDF		⊥		
HEXA				
123478 HxCDF	NA	ND		0.21
123678 HxCDF	NA	⊥		⊥
123789 HxCDF	NA	⊥		⊥
234678 HxCDF	NA	⊥		⊥
Total HxCDF		⊥		
HEPTA				
1234678 HpCDF	NA	ND		0.93
1234789 HpCDF	NA	⊥		0.20
Total HpCDF		⊥		
OCTA				
Total OCDF	NA	10.4		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
49%	83%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-07

b Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP026

Sample wt/vol: 13.64 (g/mL) g Lab File ID: 6033l010

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2233

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ~~ug/Kg~~

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.04
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.09
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.06
123678 HxCDD	NA			
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.18
Total HpCDD		ND		
OCTA				
Total OCDD	NA	1.6		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
114%	99%	113%

U 516

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-07

Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP026

Sample wt/vol: 13.64 (g/mL) g Lab File ID: 60331010

Instrument ID: HP#6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2233

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	0.043		NA
Total TCDF		0.088		
PENTA				
12378 PeCDF	NA	ND		0.02
23478 PeCDF	NA	ND		0.02
Total PeCDF		ND		
HEXA				
123478 HxCDF	NA	ND		0.06
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	ND		0.16
1234789 HpCDF	NA			0.16
Total HpCDF				
OCTA				
Total OCDF	NA	2.25		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
115%	88%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.: 5301B-08

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP027

Sample wt/vol: 11.05 (g/mL) g Lab File ID: 60331012

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2347

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.02
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.03
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.04
123678 HxCDD	NA			
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	0.09		NA
Total HpCDD		0.16		
OCTA				
Total OCDD	NA	26		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
121 %	90 %	127 %

U 336

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-08

Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP027

Sample wt/vol: 11.05 (g/mL) g Lab File ID: 60331012

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2347

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.03
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.02
23478 PeCDF	NA	ND		0.02
Total PeCDF		0.03		
HEXA				
123478 HxCDF	NA	ND		0.01
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF		0.39		
HEPTA				
1234678 HpCDF	NA	0.45		NA
1234789 HpCDF	NA	ND		0.02
Total HpCDF		1.71		
OCTA				
Total OCDF	NA	7.6		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
115%	89%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

Name: SwRI	Contract: 68-D9-0057	5301B-11
Lab Code: SwRI	Case No.:	SAS No.: 5301B	Batch:
Matrix: Soil (Sludge/Still/Ash/Soil/Water)		Lab Sample ID: 5301B-11 SPOSC
Sample wt/vol: 10.78 (g/mL) g		Lab File ID: 60401006
Instrument ID: FINN6		Date Received: 3-26-90
GC Column ID: DB-5		Date Extracted: 3-26-90
Water Sample Prep.: NA (Sepf/Cont)		Date Analyzed: 4-1-90
Extract Prep.: KD (RV/KD)		Time Analyzed: 1913
Extract Volume: 200 (uL)		Dilution Factor: 1
Injection Volume: 1.6 (uL)		

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.19
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.38
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.18
123678 HxCDD	NA			0.18
123789 HxCDD	NA			0.18
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	0.46		NA
Total HpCDD		0.81		
OCTA				
Total OCDD	NA	9.7		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
60%	80%	111%

U 401

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

S301B-11

Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: S301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: Spc30

Sample wt/vol: 10.78 (g/mL) g Lab File ID: 60401006

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1913

Extract Volume: 200 (uL) Dilution Factor: 1

Injection Volume: 1.6 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.39
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.24
23478 PeCDF	NA			0.24
Total PeCDF				
HEXA				
123478 HxCDF	NA	ND		0.22
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	~~ND~~ 0.90 (ICI)		~~0.42~~ NA
1234789 HpCDF	NA	ND		0.42
Total HpCDF		~~ND~~ 0.90		
OCTA				
Total OCDF	NA	10		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
47%	87%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.: 5301B-12

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: SAND (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP031

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331004

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1858

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	3.0		NA
Total TCDD		7.4		
PENTA				
12378 PeCDD	NA	ND		0.09
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.15
123678 HxCDD	NA			1
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.17
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.12

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
114%	101%	112%

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.
5301B-12

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: ____ SAS No.: 5301B Batch: ____

Matrix: SAND (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP031

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331004

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1850

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.04
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.06
23478 PeCDF	NA	"		0.06
Total PeCDF		"		
HEXA				
123478 HxCDF	NA	ND		0.14
123678 HxCDF	NA	"		"
123789 HxCDF	NA	"		"
234678 HxCDF	NA	"		"
Total HxCDF		"		
HEPTA				
1234678 HpCDF	NA	ND		0.35
1234789 HpCDF	NA	"		0.35
Total HpCDF		"		
OCTA				
Total OCDF	NA	ND		0.17

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
108%	82%

0 442

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-13

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP032

Sample wt/vol: 10 (g/mL) g Lab File ID: 6033105

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1937

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	1.7		NA
Total TCDD		3.3		
PENTA				
12378 PeCDD	NA	ND		0.05
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.03
123678 HxCDD	NA			1
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND 0.02 (JCP)		0.08
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.04

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
119%	106%	107%

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO. 0413

Name: SwRI	Contract: 68-D9-0057
	5301B-13

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: 5P032

Sample wt/vol: 10 (g/mL) g Lab File ID: 6033/005

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1937

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.01
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.01
23478 PeCDF	NA	1		0.01
Total PeCDF				
HEXA				
123478 HxCDF	NA	ND		0.03
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			1
Total HxCDF		1		
HEPTA				
1234678 HpCDF	NA	ND		0.06
1234789 HpCDF	NA	1		0.06
Total HpCDF				
OCTA				
Total OCDF	NA	ND		0.02

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
108%	87%

0 461

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-14

b Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP033

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331006

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2011 (TQ)

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.05
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.17
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.11
123678 HxCDD	NA			
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.25
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.25

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
110%	105%	114%

0 465

EPA SAMPLE NO.

5301B-14

1DFB

PCDF SAMPLE DATA SUMMARY

Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SB033

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331006

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2011

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.03
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.05
23478 PeCDF	NA			0.05
Total PeCDF				
HEXA				
123478 HxCDF	NA	ND		0.14
123678 HxCDF	NA			
123789 HxCDF	NA			
234678 HxCDF	NA			
Total HxCDF				
HEPTA				
1234678 HpCDF	NA	ND		0.11
1234789 HpCDF	NA			0.11
Total HpCDF				
OCTA				
Total OCDF	NA	ND		0.21

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
110%	80%

0 355

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-09

Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP028

Sample wt/vol: 10.62 (g/mL) g Lab File ID: 6033I013

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 0020

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.01
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.05
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.065
123678 HxCDD	NA			
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.25
Total HpCDD		ND		
OCTA				
Total OCDD	NA	0.38J		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
107%	99%	165%

0 356

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-09

Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP028

Sample wt/vol: 10.62 (g/mL) g Lab File ID: 60331013

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 0020

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	0.033		NA
Total TCDF		0.180		
PENTA				
12378 PeCDF	NA	ND		0.024
23478 PeCDF	NA	"		0.024
Total PeCDF		"		
HEXA				
123478 HxCDF	NA	ND		0.087
123678 HxCDF	NA	"		"
123789 HxCDF	NA	"		"
234678 HxCDF	NA	"		"
Total HxCDF		"		
HEPTA				
1234678 HpCDF	NA	ND		0.069
1234789 HpCDF	NA	"		0.069
Total HpCDF		"		
OCTA				
Total OCDF	NA	0.29 J		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
95%	104%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-10

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP029

Sample wt/vol: 10.91 (g/mL) g Lab File ID: 6040C021

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1416

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.25
Total TCDD		#1.77		
PENTA				
12378 PeCDD	NA	0.46		NA
Total PeCDD		3.18		
HEXA				
123478 HxCDD	NA	0.36		NA
123678 HxCDD	NA	0.98		1
123789 HxCDD	NA	1.08		
Total HxCDD		4.83		
HEPTA				
1234678 HpCDD	NA	2.24		NA
Total HpCDD		3.33		
OCTA				
Total OCDD	NA	9.76		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
92%	83%	62%

U 377

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-10

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: _____ Batch: _____

Matrix: Soil (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP029

Sample wt/vol: 10.91 (g/mL) g Lab File ID: 6040101

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 4-1-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1416

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.021
Total TCDF		3.81		
PENTA				
12378 PeCDF	NA	0.62		NA
23478 PeCDF	NA	0.41		NA
Total PeCDF		2.05		
HEXA				
123478 HxCDF	NA	0.82		NA
123678 HxCDF	NA	0.40		
123789 HxCDF	NA	0.58		
234678 HxCDF	NA	0.93		
Total HxCDF		3.31		
HEPTA				
1234678 HpCDF	NA	1.50		NA
1234789 HpCDF	NA	2.52		NA
Total HpCDF		4.27		
OCTA				
Total OCDF	NA	9.72		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
80%	62%

0 484

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-15

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Solvent (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP034

Sample wt/vol: 160 (g/mL) mL Lab File ID: 60331003

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: NA (RV/KD) Time Analyzed: 1819

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.005
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.009
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.013
123678 HxCDD	NA			0.013
123789 HxCDD	NA			0.013
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.020
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.012

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
92%	103%	134%

1DFB

PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO. 0 ADT

5301B-15

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Solvent (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP034

Sample wt/vol: 160 (g/mL) mL Lab File ID: 60331003

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: NA (RV/KD) Time Analyzed: 1819

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.001
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.004
23478 PeCDF	NA	ND		0.004
Total PeCDF		ND		
HEXA				
123478 HxCDF	NA	ND		0.013
123678 HxCDF	NA	"		0.013
123789 HxCDF	NA	"		0.013
234678 HxCDF	NA	"		0.013
Total HxCDF		"		
HEPTA				
1234678 HpCDF	NA	ND		0.013
1234789 HpCDF	NA	"		0.013
Total HpCDF		"		
OCTA				
Total OCDF	NA	ND		0.007

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
106%	96%

0 505

EPA SAMPLE NO.

1DFA

PCDD SAMPLE DATA SUMMARY

Solid Method Blk

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5304B Batch: _____

Matrix: Na2SO4 (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SMB (3-26-90)

Sample wt/vol: 10 (g/mL) g Lab File ID: 6033l001

Instrument ID: FINN6 Date Received: NA

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1633

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.07
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.08
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.15
123678 HxCDD	NA			
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.07
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.29

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
107%	105%	91%

0 506

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

Solid Method Blk

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: (H2SO4) (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SMB (3-26-90)

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331001

Instrument ID: FINN6 Date Received: NA

GC Column ID: DB-5 Date Extracted: 3-26-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1633

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.01
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.05
23478 PeCDF	NA	"		0.05
Total PeCDF		"		
HEXA				
123478 HxCDF	NA	ND		0.12
123678 HxCDF	NA	"		"
123789 HxCDF	NA	"		"
234678 HxCDF	NA	"		"
Total HxCDF		"		
HEPTA				
1234678 HpCDF	NA	ND		0.20
1234789 HpCDF	NA	"		0.20
Total HpCDF		"		
OCTA				
Total OCDF	NA	ND		0.16

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
106%	82%

0 525

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

Solid Method Blk

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 4301B Batch: _____

Matrix: Na_2SO_4 (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SMB(3/27/90)

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331002

Instrument ID: FINN6 Date Received: NA

GC Column ID: DB-5 Date Extracted: 3/27/90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3/31/90

Extract Prep.: KD (RV/KD) Time Analyzed: 1712

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg (ppb)

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	ND		0.06
Total TCDD		ND		
PENTA				
12378 PeCDD	NA	ND		0.07
Total PeCDD		ND		
HEXA				
123478 HxCDD	NA	ND		0.15
123678 HxCDD	NA			1
123789 HxCDD	NA			
Total HxCDD				
HEPTA				
1234678 HpCDD	NA	ND		0.18
Total HpCDD		ND		
OCTA				
Total OCDD	NA	ND		0.25

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
105%	107%	133%

1DFB
PCDF SAMPLE DATA SUMMARY

0 526
EPA SAMPLE NO.

Solid Method Blk

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Na2SO4 (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SMB(3-27-90)

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331002

Instrument ID: FINN6 Date Received: NA

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 1712

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/g (ppb)

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	ND		0.36
Total TCDF		ND		
PENTA				
12378 PeCDF	NA	ND		0.07
23478 PeCDF	NA	"		0.07
Total PeCDF		"		
HEXA				
123478 HxCDF	NA	ND		0.13
123678 HxCDF	NA	"		"
123789 HxCDF	NA	"		"
234678 HxCDF	NA	"		"
Total HxCDF		"		
HEPTA				
1234678 HpCDF	NA	ND		0.17
1234789 HpCDF	NA	"		0.17
Total HpCDF		"		
OCTA				
Total OCDF	NA	ND		0.13

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
100%	96%

0 545

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-16 MB

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP#35

Sample wt/vol: 10 (g/mL) g Lab File ID: 6033007

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2042

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	5.5		NA
Total TCDD		5.5		
PENTA				
12378 PeCDD	NA	5.2		NA
Total PeCDD		5.2		
HEXA				
123478 HxCDD	NA	ND		0.13
123678 HxCDD	NA	44		NA
123789 HxCDD	NA	ND		0.13
Total HxCDD		44		
HEPTA				
1234678 HpCDD	NA	4.7		NA
Total HpCDD		4.7		
OCTA				
Total OCDD	NA	8.6		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
116%	107%	111%

U 546

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-16MS

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: ____ SAS No.: 5301B Batch: ____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP035

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331007

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2042

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	4.4		NA
Total TCDF		4.4		
PENTA				
12378 PeCDF	NA	4.9		NA
23478 PeCDF	NA	~~4.9~~ ND		0.01
Total PeCDF		4.9		
HEXA				
123478 HxCDF	NA	ND		0.03
123678 HxCDF	NA	5.2		NA
123789 HxCDF	NA	ND		0.03
234678 HxCDF	NA	ND		0.03
Total HxCDF		5.2		
HEPTA				
1234678 HpCDF	NA	5.3		NA
1234789 HpCDF	NA	ND		0.13
Total HpCDF		5.3		
OCTA				
Total OCDF	NA	7.6		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
107%	84%

1DFA
PCDD SAMPLE DATA SUMMARY

EPA SAMPLE NO.
5301B-16MSD

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: ____ SAS No.: 5301B Batch: ____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP036

Sample wt/vol: 10 (g/mL) g Lab File ID: 6033I20B

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2123

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDD	NA	5.5		NA
Total TCDD		5.5		
PENTA				
12378 PeCDD	NA	5.0		NA
Total PeCDD		5.0		
HEXA				
123478 HxCDD	NA	ND		0.10
123678 HxCDD	NA	4.6		NA
123789 HxCDD	NA	ND		0.10
Total HxCDD		4.6		
HEPTA				
1234678 HpCDD	NA	6.1		NA
Total HpCDD		6.1		
OCTA				
Total OCDD	NA	9.2		NA

INTERNAL STANDARD RECOVERIES

13C-TCDD	13C-HxCDD	13C-OCDD
120%	97%	138%

U 566

1DFB
PCDF SAMPLE DATA SUMMARY

EPA SAMPLE NO.

5301B-16 MSD

Lab Name: SwRI Contract: 68-D9-0057

Lab Code: SwRI Case No.: _____ SAS No.: 5301B Batch: _____

Matrix: Sand (Sludge/Still/Ash/Soil/Water) Lab Sample ID: SP036

Sample wt/vol: 10 (g/mL) g Lab File ID: 60331008

Instrument ID: FINN6 Date Received: 3-26-90

GC Column ID: DB-5 Date Extracted: 3-27-90

Water Sample Prep.: NA (Sepf/Cont) Date Analyzed: 3-31-90

Extract Prep.: KD (RV/KD) Time Analyzed: 2123

Extract Volume: 100 (uL) Dilution Factor: 1

Injection Volume: 2 (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

ANALYTE	PEAKS	CONCENTRATION	Q	EMPC/EDL
TETRA				
2378 TCDF	NA	4.4		NA
Total TCDF		4.4		
PENTA				
12378 PeCDF	NA	4.7		NA
23478 PeCDF	NA	ND		0.02
Total PeCDF		4.7		
HEXA				
123478 HxCDF	NA	ND		0.08
123678 HxCDF	NA	4.8		NA
123789 HxCDF	NA	ND		0.08
234678 HxCDF	NA	ND		0.08
Total HxCDF		4.8		
HEPTA				
1234678 HpCDF	NA	5.4		NA
1234789 HpCDF	NA	ND		0.15
Total HpCDF		5.4		
OCTA				
Total OCDF	NA	7.4		NA

INTERNAL STANDARD RECOVERIES

13C-TCDF	13C-HpCDF
119%	86%

RECORD OF COMMUNICATION

☐ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE
☐ OTHER (SPECIFY)

(Record of item checked above)

TO:
GEORGE KARRAS
EPA/MMB

FROM:
RSCC/ESAT

DATE
18 APRIL 1990

TIME

SUBJECT

CLP Dioxin Data Packages for Quality Assurance Review

SUMMARY OF COMMUNICATION

Attached are the following CLP Dioxin /SAS Data Packages to be reviewed for Quality Assurance.

SITE	CASE/SAS NO.	LABORATORY	MATRIX	NO. of SAMPLES
WALTONS FARM TATW/SI	5301B	SWRI	soil	15
			water	1

CONCLUSIONS, ACTION TAKEN OR REQUIRED

RECEIVED
APR 25 1990
S&I BRANCH

INFORMATION COPIES
TO:

PCDFs/PCDDs Data Assessment

CASE NO. 5301B LABORATORY SWRI SITE Waltons Farm

SAMPLE NO. 5301B-01 — 5301B-15

DATA ASSESSMENT:

All data are valid and acceptable except those values which have been red-lined (rejected) or qualified "J" (estimated). Red-line data does not imply the analyte is not present. It means that due to significant QC problems the analysis is invalid and it provides no information as to whether the compound is present or not.

All action is detailed on the attached sheets.

Reviewer's Signature: Stelios Gerazounis Date: 4/24/1990

Verified By: _____ Date: ___/___/19___

Case # 5301B
Site: Waltons Farm
Lab: SWRI

Overall Assessment

1. Generally, the quality of the data is good.
   a) The EPA PEM sample results are all within the 99% prediction interval.
   b) The matrix spike/matrix duplicate results are all within the QC limits.
   c) Most of the internal standard recoveries are within the QC limits. Only a few, mostly ^{13}C-OCDD are above the upper required limits and only one (165% recovery) resulted in the qualification of OCDD and OCDF data with J. The relatively high recoveries may be due in part to the interfering compounds.

2. PCDD/PCDF toxicity equivalency was calculated using the concentration of the analyte when present and the maximum possible concentration or estimated detection limit when the analyte was not identified as present. Consequently the TEF conc values listed in (Table) FORM II PCDD are the maximum possible toxicity value

S Georgeson
4/24/90

Case # 5301B
Site: Walton's Farm
Lab: SWRI

Contract Problems / Non-Compliance

The window defining mix (WDM) did not contain the three TCDD isomers which are the closest eluting to the 2,3,7,8-TCDD isomer on the SP-2331 column. Since the chromatographic column DB-5 was used for the analysis the absence of these isomers from the WDM has no effect on the quality of the data. The resolution of the ^{13}C 2378 TCDD and ^{13}C 1234 TCDD on the DB-5 column meets the method requirement.

DPO: [ ] ACTION [ ] FYI Region_____

ORGANIC REGIONAL DATA ASSESSMENT SUMMARY

CASE NO. 5301B LABORATORY SWRI

SDG NO. _____ DATA USER TATW

SOW _____ REVIEW COMPLETION DATE 4/24/90

NO. OF SAMPLES 1 WATER 15 SOIL _____ OTHER

REVIEWER [ ] ESD [ ] ESAT [ ] OTHER, CONTRACT/CONTRACTOR _____

	VOA	BNA	PEST	OTHER (PCDD/PCDF)
1. HOLDING TIMES				O
2. GC-MS TUNE/ GC PERFORMANCE				O
3. INITIAL CALIBRATIONS				O
4. CONTINUING CALIBRATIONS				O
5. FIELD BLANKS ("F" = not applicable)				O
6. LABORATORY BLANKS				O
7. SURROGATES				O
8. MATRIX SPIKE/DUPLICATES				O
9. REGIONAL QC ("F" = not applicable)				F
10. INTERNAL STANDARDS				O
11. COMPOUND IDENTIFICATION				O
12. COMPOUND QUANTITATION				O
13. SYSTEM PERFORMANCE				O
14. OVERALL ASSESSMENT				O

O = No problems or minor problems that do not affect data usability.
X = No more than *about* 5% of the data points are qualified as either estimated or unusable.
M = More than *about* 5% of the data points are qualified as estimated.
Z = More than *about* 5% of the data points are qualified as unusable.

DPO ACTION ITEMS: _____

AREAS OF CONCERN: _____

TAT-02-F-0260

SAMPLING TRIP REPORT

Site Name: Walton's Farm

TDD No.: 02-9010-0033

Sampling Dates: March 21, 1991

1. Site Location: Delran, Burlington County, New Jersey

2. Sample Locations: See Table 1 and Figure 2

3. Sample Descriptions: See Table 2

4. Laboratories Receiving Samples:

Sample Matrix	Analysis Required	Laboratory
Soil & Rinsate	Pesticides, arsenic and thallium	Analytikem, Inc. 28 Springfield Avenue Cherry Hill, NJ 08003

5. Sample Dispatch:

All samples were delivered to Analytikem by the sampling team. Delivery was made at 1500 hours on 21 March, 1991.

6. Sampling Personnel:

Name	Organization	Function
Eric Wilson	Roy F. Weston, TAT-II	Project Manager
Michael Mentzel	Roy F. Weston, TAT-II	Overall QA/QC
Michael Edwards	Roy F. Weston, TAT-II	Sampler

7. Sample Collection Procedure:

All soil and sediment samples were collected 0-6" below ground surface. These samples were collected with either a virgin plastic scoop or a decontaminated stainless steel trowel. Samples were mixed in decontaminated stainless steel mixing bowls prior to transfer to sample bottles. All samples with the exception of the field blank, were split with Dave Caballero of Rizzo Associates, who was acting on behalf of PPG Industries, a PRP for the site.

Field blanks were prepared by rinsing decontaminated sampling equipment with instrument analyzed water. As mentioned previously, field blanks were not split but were prepared separately, using separate sets of decontaminated sampling supplies and independently obtained instrument analyzed water.

8. Equipment Decontamination Procedure

All sampling equipment was decontaminated prior to the site visit. Separate sets of equipment were used for each sampling point. The decontamination procedure used is as follows:

a) wash with low phosphate soap, tap water rinse;
b) rinse with a 10% nitric acid solution;
c) rinse with acetone;
d) rinse with hexane;
e) rinse with instrument analyzed water.

The hexane and acetone used for decontamination were analyzed and certified suitable for pesticide residual analysis.

9. Report Prepared by: Eric Wilson Date: 3/26/91

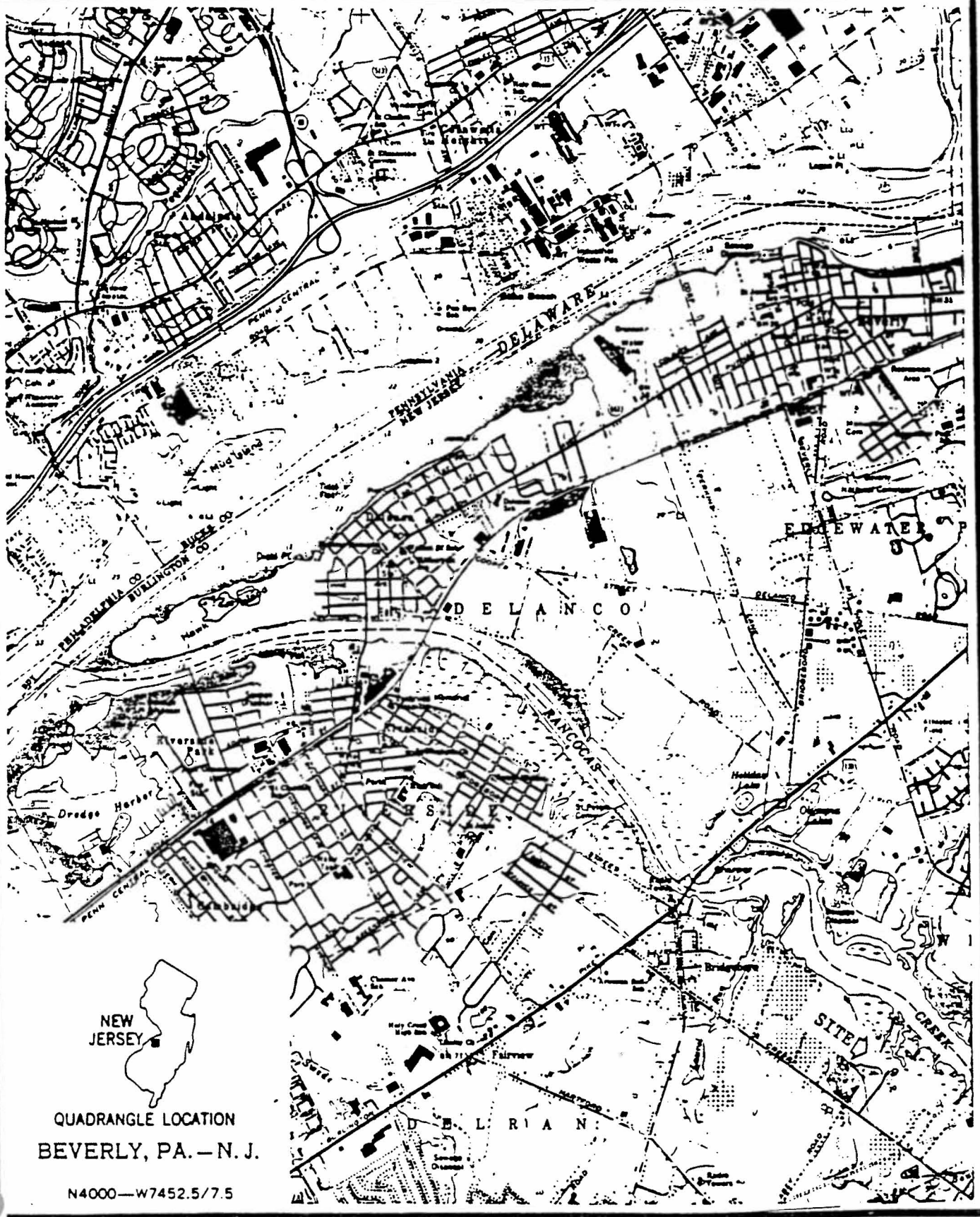
10. Report Approved by: Michael Mentzel Date: 3/27/91

TABLE 1
SAMPLE LOCATIONS

Sample #	Rizzo Sample #	Time	Location
[illegible]	SO-1	1000	15' from highwater mark
2	SO-2	1045	D + 100'
3	SO-3	1100	D + 200'
4	SO-4	1110	D + 300'
5	SO-5	1120	C + 100'
6 (MS/MSD)	SO-5 (MS)	1120	C + 100'
-	SO-5 (MSD)	1120	C + 100'
7	SO-6	1130	C + 200'
8 (Duplicate of WF7)	SO-11	1130	C + 200'
9	SO-7	1140	C + 300'
F10	SO-8	1150	B + 100'
F11	SO-9	1155	B + 200'
F12	SO-10	1200	B + 300'
F13 (Rinsate Blank)	EB-1	1230	N/A

TABLE 2
SAMPLE DESCRIPTIONS

SAMPLE #	TYPE/DESCRIPTION
WF1	Creek sediment - collected 15' NE of high water mark. Sample collected at low tide. Sample depth 0-6" below surface.
WF2	Soil - collected 100' east of point D, along line AD, in wooded area adjacent to the landfill. Sample depth 0-6" below ground surface.
WF3	Soil - collected 200' east of point D along line AD, in wooded area adjacent to the landfill. Sample depth 0-6" below ground surface.
WF4	Soil - collected 300' east of point D along line AD, in wooded area adjacent to the landfill. Sample depth 0-6" below ground surface.
WF5	Soil - collected 100' south southwest of point C along line AC in farm field south of landfill. Sample depth 0-6" below ground surface.
WF6	Soil - matrix spike/matrix spike duplicate, duplicate of WF5. Collected 100' south southwest of point C along line AC in farm field south of landfill. Sample depth 0-6" below ground surface.
WF7	Soil - collected 200' south southwest of point C along line AC in farm field south of landfill. Sample depth 0-6" below ground surface.
WF8	Soil - blind duplicate of WF7. Collected 200' south southwest of point C along line AC in farm field south of landfill. Sample depth 0-6" below ground surface.
WF9	Soil - collected 300' south southwest of point C along line AC in farm field south of landfill. Sample depth 0-6" below ground surface.
WF10	Soil - collected 100' west southwest of point B along line AB, in the farm field south of the landfill. Sample depth 0-6" below ground surface.
WF11	Soil - collected 200' west southwest of point B along line AB, in the farm field south of the landfill. Sample depth 0-6" below ground surface.
WF12	Soil - collected 300' west southwest of point B along line AB, in the farm field south of the landfill. Sample depth 0-6" below ground surface.
WF13	Aqueous - field blank, prepared by rinsing clean sampling equipment with instrument analyzed water.



WESTON — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION		EPA PM Graham	Figure 1
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.		TAT PM Wilson	Waltons Farm

28 Springdale Road
Cherry Hill, New Jersey 08003
Phone: (609) 751-1122
Fax: (609) 751-0824

454 S. Anderson Road BTC 532
Rock Hill, South Carolina 29730
Phone (803) 329-9690
Fax: (803) 329-9689

AnalytiKEM # 24156 CLIENT CONTACT: Diamond Devine

CLIENT: Weston TAT DATE SAMPLED: 3-21-91

PROJECT: Soil RELEASED BY: DCH

TCL Metals

AnalytiKEM #	1	2	3	4	5	6	7
Client Designation	see	attached		sheet			
Parameters:							
Aluminum							
Antimony							
Arsenic	33,000	20,000	27,000	1,900	5,500	6,000	5,600
Barium							
Beryllium							
Cadmium							
Calcium							
Chromium							
Cobalt							
Copper							
Iron							
Lead							
Magnesium							
Manganese							
Nickel							
Potassium							
Mercury							
Selenium							
Silver							
Thallium	1,600 u	1,100 u	1,200 u	2,100 u	1,000 u	1,000 u	1,000 u
Vanadium							
Zinc							

NOTE: ALL AVAILABLE INFORMATION ABOVE IS PRELIMINARY, FINAL APPROVED DATA WILL BE INCLUDED IN FINAL REPORT.

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454 S. Anderson Road BTC 532
Rock Hill, South Carolina 29730
Phone (803) 329-9690
Fax: (803) 329-9689

AnalytiKEM # 2456

CLIENT CONTACT: Desmond Devine

CLIENT: Weston TAT

DATE SAMPLED: 3-21-91

PROJECT: Soil

RELEASED BY: DCH

TCL Metals

AnalytiKEM #	8	9	10	11	12	13
Client Designation	see	attached		sheet		
Parameters:						
Aluminum						
Antimony						
Arsenic	4,900	6,800	4,200	4,700	4,200	10 u
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Nickel						
Potassium						
Mercury						
Selenium						
Silver						
Thallium	1,000 u	1,000 u	1,000 u	1,000 u	1,000 u	40 u
Vanadium						
Zinc						

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Phone: (609) 751-1122
Fax: (609) 751-0824

454 S. Anderson Road BTC 532
Rock Hill, South Carolina 29730
Phone (803) 329-9690
Fax: (803) 329-9689

AnalytiKEM # 24156

CLIENT: Weston T&T

PROJECT: Soil

CLIENT CONTACT: Desmond Devine

DATE SAMPLED: 3-21-91

RELEASED BY: DEV

Pesticides

AnalytiKEM #	1	2	3	4	5	6	7
Client Designation	All	attached	sheet				
Parameters:							
alpha-BHC	320 u	350 u	400 u	690 u	340 u	340 u	340 u
beta-BHC	↓	↓	↓	↓	↓	↓	↓
delta-BHC	↓	↓	↓	↓	↓	↓	↓
gamma-BHC (Lindane)	↓	↓	↓	↓	↓	↓	↓
Heptachlor	↓	↓	↓	↓	↓	↓	↓
Aldrin	↓	↓	↓	↓	↓	↓	↓
Heptachlor Epoxide	↓	↓	↓	↓	↓	↓	↓
Endosulfan I	↓	↓	↓	↓	↓	↓	↓
Dieldrin	↓	↓	↓	↓	↓	↓	↓
4,4'-DDE	5,800	170 J	2,900	900	920	980	32 J
Endrin	320 u	350 u	400 u	690 u	340 u	340 u	340 u
Endosulfan II	↓	↓	↓	↓	↓	↓	↓
4,4'-DDD	12,000	3,600	1700	190 J	1600	700	11 J
Endosulfan Sulfate	320 u	350 u	400 u	690 u	340 u	340 u	340 u
4,4'-DDT	42,000	23,000	18,000	130 J	16,000	8300	↓
Endrin Aldehyde	320 u	350 u	400 u	690 u	340 u	340 u	↓
Endrin Ketone	↓	↓	↓	↓	↓	↓	↓
Methoxychlor	↓	↓	↓	↓	↓	↓	↓
Chlordane	↓	↓	↓	↓	↓	↓	↓
alpha-Chlordane	↓	↓	↓	↓	↓	↓	↓
gamma-Chlordane	↓	↓	↓	↓	↓	↓	↓
Toxaphene	↓	↓	↓	↓	↓	↓	↓

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454 S. Anderson Road BTC 532
Rock Hill, South Carolina 29730
Phone (803) 329-9690
Fax: (803) 329-9689

AnalytiKEM # 24156

CLIENT CONTACT: Desmond Devine

CLIENT: Weston TAT

DATE SAMPLED: 3-21-91

PROJECT: Soil

RELEASED BY: DEV

Pesticides

AnalytiKEM #	8	9	10	11	12	13
Client Designation	See attached sheet					
Parameters:						
alpha-BHC	340u	340u	340u	340u	340u	10u
beta-BHC	↓	↓	↓	↓	↓	↓
delta-BHC						
gamma-BHC (Lindane)						
Heptachlor						
Aldrin						
Heptachlor Epoxide						
Endosulfan I						
Dieldrin	↓	↓	↓			
4,4'-DDE	26J	18J	26J			
Endrin	340u	340u	340u			
Endosulfan II	↓	↓	↓			
4,4'-DDD	11J	↓	13J			
Endosulfan Sulfate	340u	↓	340u			
4,4'-DDT	19J	22J	32J			
Endrin Aldehyde	340u	340u	340u			
Endrin Ketone	↓	↓	↓			
Methoxychlor						
Chlordane						
alpha-Chlordane						
gamma-Chlordane						
Toxaphene	↓	↓	↓	↓	↓	↓

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CUSTOMER ORDER - ANALYTIKEM
(PAGE 2)

Proper Temp: Y
Proper Pres: Y

-NO. C024156 CLIENT: Weston TAT

300ml Amb 1 liter

-NO.	CLIENT DESIGNATION	MATRIX	SOLUBILITY H2O	SOLUBILITY MeCL	SOLUBILITY Hex	Date Sampled	vials	ORG	UNPRES	HNO3	HCl	H2SO4	NaOH	Other	STER
001	WF-1	Solid				03/21/91			1						
002	WF-2	Solid				03/21/91			1						
003	WF-3	Solid				03/21/91			1						
004	WF-4	Solid				03/21/91			1						
005	WF-5	Solid				03/21/91			1						
006	WF-6	Solid				03/21/91			1						
007	WF-7	Solid				03/21/91			1						
008	WF-8	Solid				03/21/91			1						
009	WF-9	Solid				03/21/91			1						
010	WF-10	Solid				03/21/91			1						
011	WF-11	Solid				03/21/91			1						
012	WF-12	Solid				03/21/91			1						
013	WF-13 F.B.	LIQUID	Y	N	N	03/21/91			2						

DEFINITIONS

Circle Applicable Definitions:

ND - Not Detected

U - Not detected at Practical Quantitation Limit

J - Estimated quantity below Practical Quantitation Limit

Units:

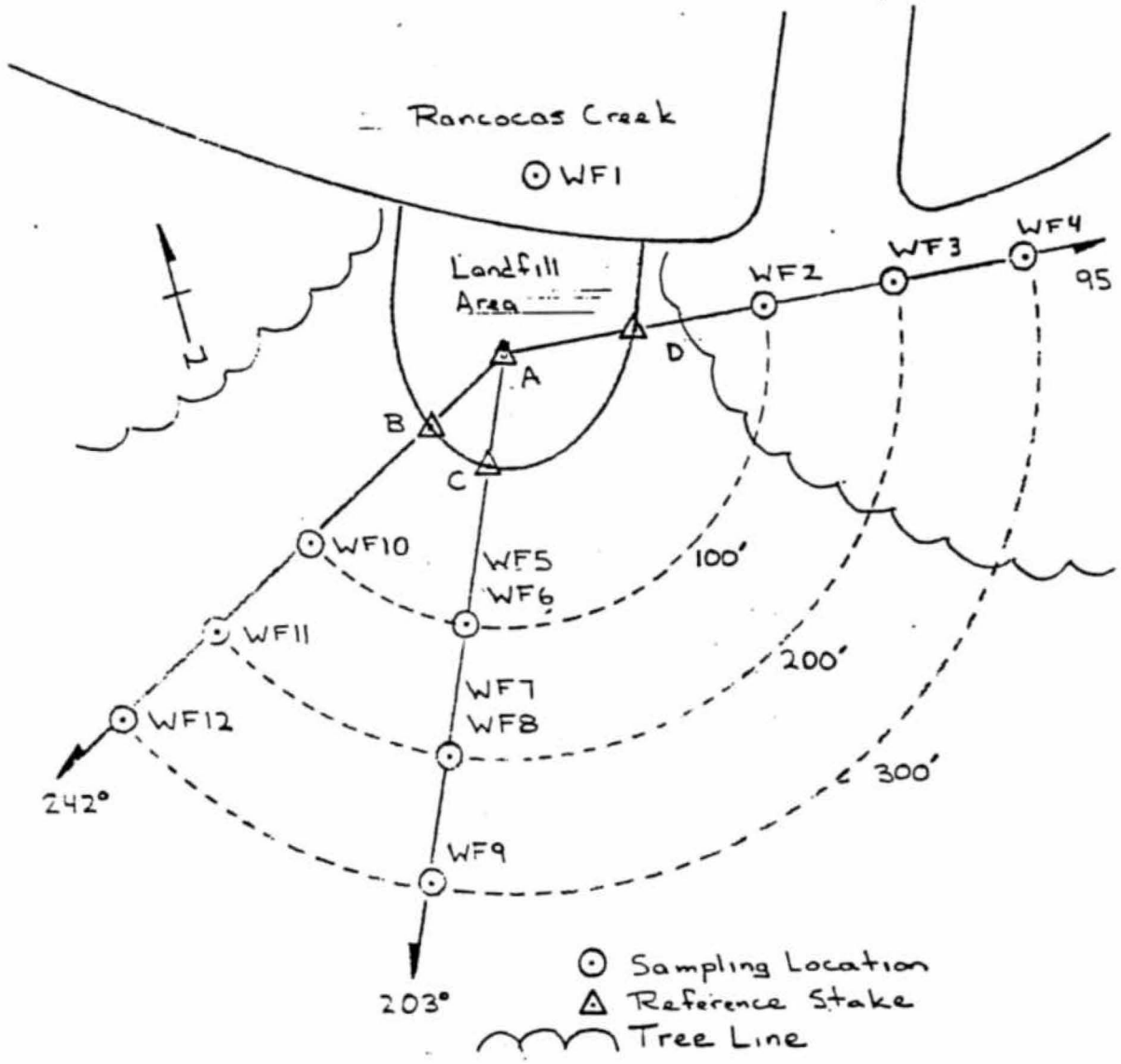
ppm - parts per million - ug/ml, ug/g

ppb - parts per billion - ug/l, ug/kg

ppb dw - parts per billion on a dry weight basis

Additional Information:

NOTE: ALL AVAILABLE INFORMATION ABOVE IS PRELIMINARY, FINAL APPROVED DATA WILL BE INCLUDED IN FINAL REPORT.



WESTON	Roy F. Weston, Inc. MAJOR PROGRAMS DIVISION	EPA PM D. Graham	Figure 2
	IN ASSOCIATION WITH FOSTER WHEELER CORP., C.C JOHNSON & MALHOTRA, P.C., RESOURCE APPLICATIONS, INC. AND R.E. SARRIERA ASSOCIATES	TAT PM E. Wilson	Sample Locations

CHAIN OF CUSTODY RECORD

ENVIRONMENTAL PROTECTION AGENCY - REGION II
ENVIRONMENTAL SERVICES DIVISION
EDISON, NEW JERSEY 08817

T2 04677

Name of Unit and Address: U.S. EPA TAT 2 — Bldg 209, Woodbridge Ave, Edison NJ 08837

EPA PM: Don Graham (908) 321-4345

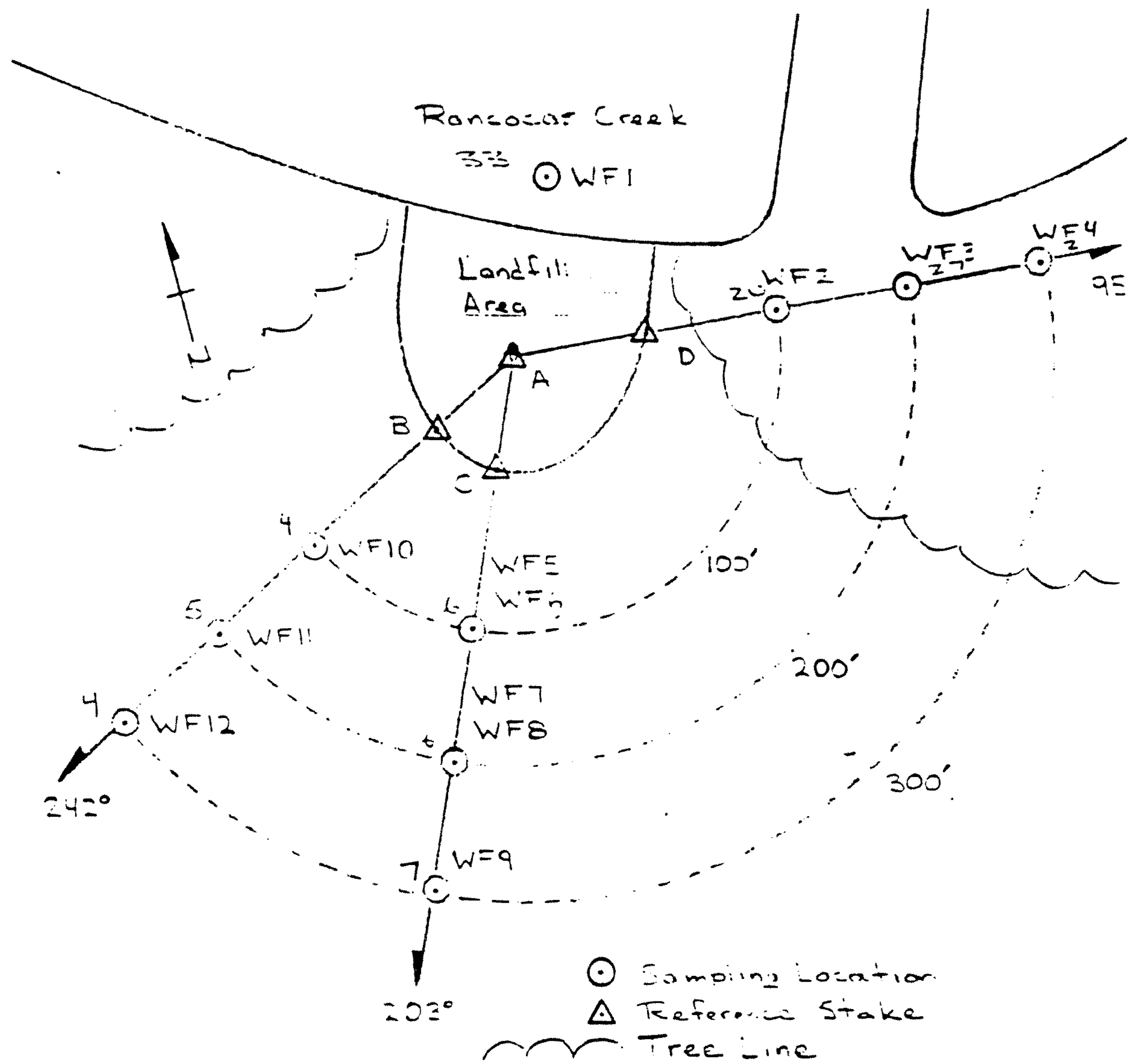
Sample Number	Number of Containers	Description of Sample
WF-1	1	Pesticides, Arsenic, Thallium
WF-2	1	Pesticides Arsenic Thallium
WF-3	1	" "
WF-4	1	" "
WF-5	1	" "
WF-6	1	pesticides, Arsenic Thallium (MS/MSD)
WF-7	1	" "
WF-8	1	" "
WF-9	4	" "
WF-10	1	" "
WF-11	1	" "
WF-12	1	" "
WF-13	2	1 x 1 liter (Poly) Field Blank (As, Tl); 1 x 1 liter (glass) Field Blank (Pesticide)

Person Assuming Responsibility for Sample: Eric Wilson, TAT — Eric Wilson — Time: 1400 — Date: 3-21-91

Sample Number	Relinquished By	Received By	Time	Date	Reason for Change of Custody
All	Eric Wilson	[illegible]	1350	3-21-91	Laboratory Analysis

Page No.

20



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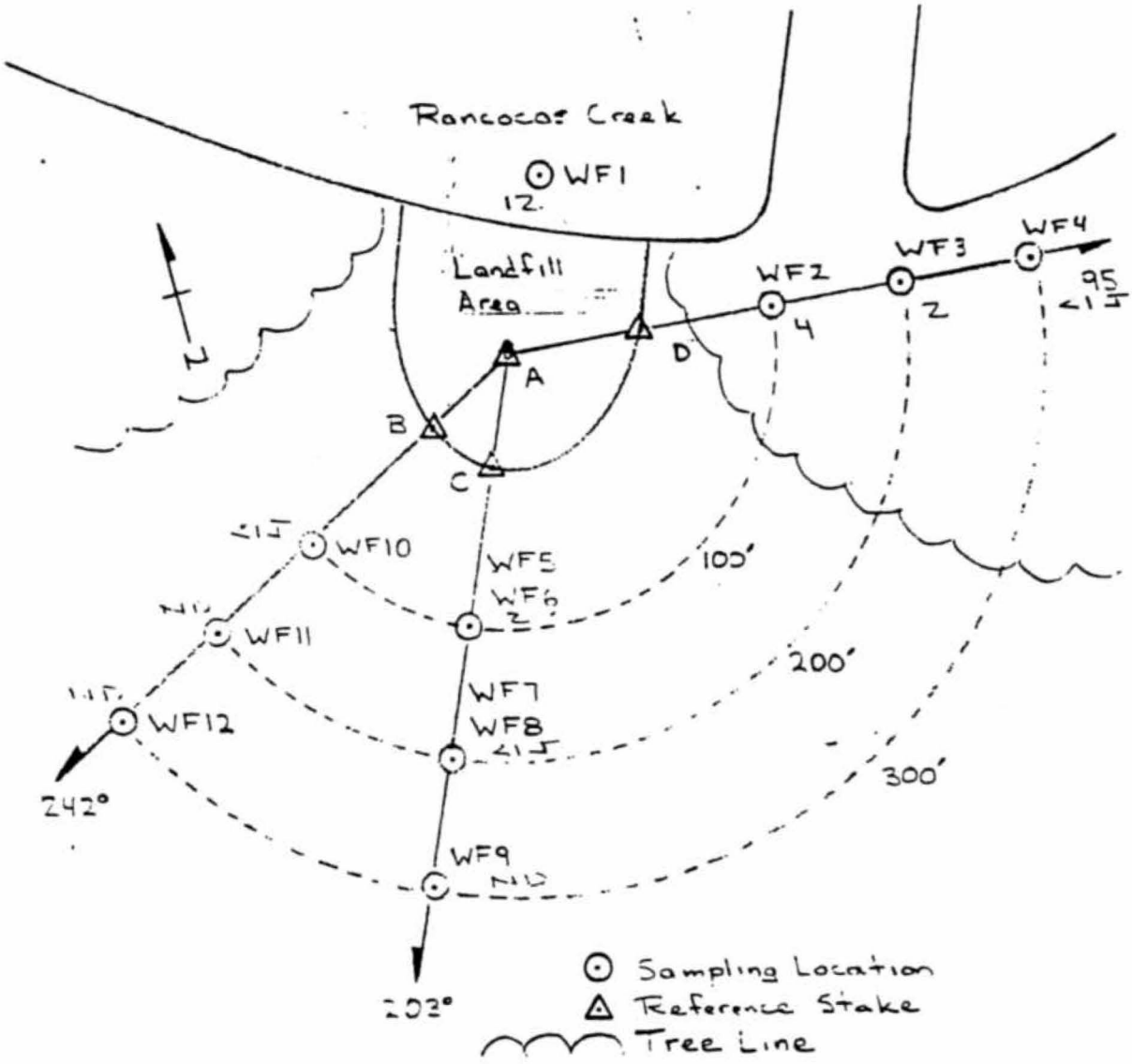
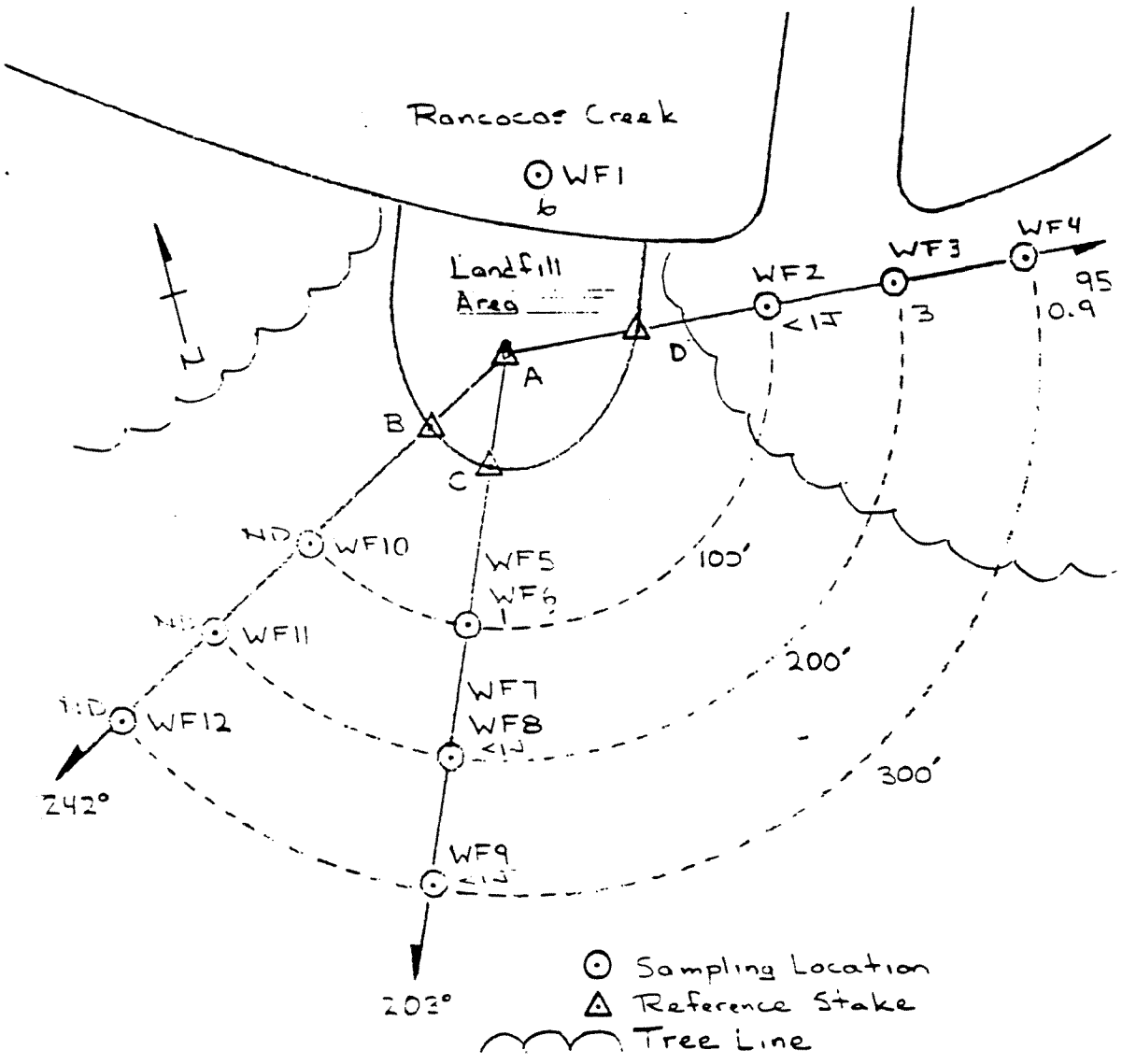


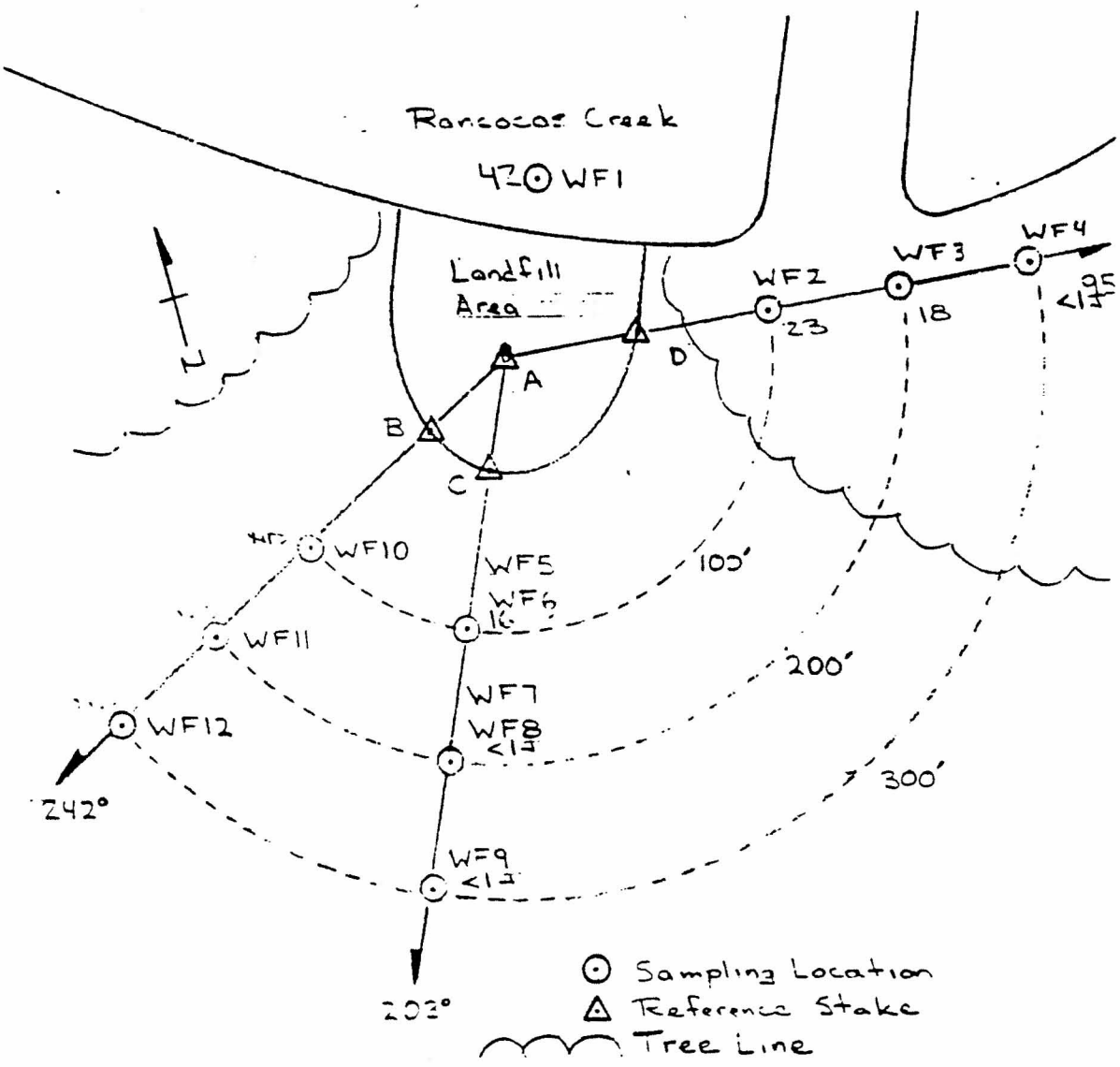
WESTON Roy F. Weston, Inc. MAJOR PROGRAMS DIVISION		EPA PM D. Graham	Figure 2
IN ASSOCIATION WITH FOSTER WHEELER CORP., C.C JOHNSON & MALHOTRA, P.C., RESOURCE APPLICATIONS, INC. AND R.E. SARRIERA ASSOCIATES		TAT PM E. Wilson	Sample Locations

DDE



WESTON	Roy F. Weston, Inc. MAJOR PROGRAMS DIVISION	EPA PM D. Graham	Figure 2
	IN ASSOCIATION WITH FOSTER WHEELER CORP., C.C JOHNSON & MALHOTRA, P.C., RESOURCE APPLICATIONS, INC. AND R.E. SARRIERA ASSOCIATES	TAT PM E. Wilson	Sample Locations

DDT MAJOR PRAL 1-10 ppm



WESTON Roy F. Weston, Inc. MAJOR PROGRAMS DIVISION	EPA PM D. Graham	Figure 1
IN ASSOCIATION WITH FOSTER WHEELER CORP., C.C JOHNSON & MALHOTRA, P.C., RESOURCE APPLICATIONS, INC. AND R.E. SARRIERA ASSOCIATES	TAT PM E. Wilson	Sample Locations

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

IN THE MATTER OF WALTON'S FARM PPG Industries, Inc., Respondent Proceeding Under Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act, as amended, 42 U.S.C. §9606(a)	ADMINISTRATIVE ORDER ON CONSENT Index No. II-CERCLA-

JURISDICTION

1. This Administrative Order on Consent (Order) is issued to the above named Respondent by the United States Environmental Protection Agency (EPA) pursuant to the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. §9606(a). This authority was delegated to the Administrator of the EPA by Executive Order 12580, dated January 23, 1987, and duly redelegated to the Regional Administrator, EPA Region II. Notice of this Order has been given to the New Jersey State Department of Environmental Protection (DEP) as required by 42 U.S.C. §9606(a).

DEFINITIONS

2. As used in this Order, unless the context clearly requires some other meaning, the following terms shall have the following meanings:

A. EPA shall mean the United States Environmental Protection Agency.

B. DEP shall mean the New Jersey Department of Environmental Protection.

C. PPG shall mean PPG Industries, Inc., the Respondent under this Administrative Order, which has its headquarters and principal place of business located at One PPG Place, Pittsburgh, Pennsylvania 15272; such term also includes all agents, successors, and assigns who perform or who

are charged with performing any activities pursuant to this Order.

D. The Site shall mean the contaminated area directly adjacent to the mud flats of Rancocas Creek located within the 37.42 acres of real property known as Walton's Farm and designated as Block 119, Lot 16 on the Delran tax map in Delran Township, Burlington County, New Jersey. Walton's Farm is currently owned by Dr. Rudolph C. Camishion and Nancy Camishion.

E. CERCLA shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §9601 et seq.

F. Hazardous substance(s) shall be used as that term is defined in Section 101(14) of CERCLA, 42 U.S.C. §9601(14).

G. Facility Coordinator shall mean the person designated by PPG, who shall be charged with the duty of being at all times knowledgeable of the performance of all work performed pursuant to this Order.

H. On-Scene Coordinator (OSC) shall mean the person designated by EPA to be responsible for on-scene monitoring of all actions and activities required pursuant to this Order, and for receipt of all items submitted to EPA under this Order. The OSC shall additionally be responsible for coordinating and directing any EPA removal actions, as defined in the National Contingency Plan, which may be conducted at the Site.

I. National Contingency Plan (NCP) shall mean the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300, and all amendments thereto.

J. Oversight Costs shall mean those direct and indirect costs for activities to which EPA, or its contractor, agents or representatives perform associated with development, issuance and implementation of this Order. Such activities include all costs associated with:

a. negotiating, preparing, and reviewing this Order;

b. reviewing and providing comments on documents prepared pursuant to this Order, including the Site Operations Plan and Site Report;

c. organization and participation in technical meetings between EPA and Respondents conducted to implement this Order;

d. conducting of any required community relations tasks, including briefing of state and local officials and preparation of press releases or fact sheets for the public with respect to the activities to be performed under this Order;

e. on-site presence and periodic Site inspections to oversee the implementation of this Order;

f. environmental monitoring, if deemed necessary by EPA to determine PPG's compliance with this Order;

g. taking of confirmatory samples, if deemed necessary by EPA;

h. certification that the work under this Order has been completed;

i. EPA activities associated with obtaining access to off-site properties, if required for the implementation of this Order;

j. EPA enforcement activities, as required for the implementation of this Order.

PARTIES BOUND

3. This Order shall apply to and be binding upon Respondent and its agents, successors, and assigns.

FINDINGS

4. PPG is a person as that term is defined in Section 101(21) of CERCLA, 42 U.S.C. §9601(21).

5. Respondent PPG, known then as the Pittsburgh Plate Glass Company, during the period of time extending from on or about December 30, 1948 to on or about November 29, 1963, operated a business in Moorestown that routinely received and handled pesticides, herbicides, fungicides and/or other

chemicals, including but not limited to the following: aldrin, dichlorodiphenyl trichloromethane (DDT), dieldrin, endrin, lindane, malathion, methoxychlor, pentachloronitrobenzene (PCNB), rotenone, and sevin.

6. Walton's Farm is located off Creek Road in Delran Township, Burlington County, New Jersey and encompasses 37.42 acres. The Site (located on the Walton's Farm property) consists of an area measuring approximately 100' by 200' directly adjacent to the mud flats of Rancocas Creek. The Rancocas Creek empties into the Delaware River.

7. Approximately a dozen homes are built within a half mile of the Site. The area between the Site and the homes is open area and there is a park across the Rancocas Creek from the Site.

8. The Site is presently unoccupied and could be entered by trespassers.

9. The Walton's Farm property was owned by Henry Walton from on or about December 1, 1938 until his death on or about April 11, 1979.

10. During a portion of the time that Mr. Walton owned the property, PPG and/or agents for PPG transported to and disposed at the Site numerous materials and off-spec products from PPG's Moorestown facility, including DDT, sulfur, and iron pyrites.

11. Evidence of environmental contamination at the Site includes soil discoloration and the absence of vegetation over large portions of the Site. Erosion has exposed physical signs of the dumping, such as bags and bottles of material, and caused material to migrate. Surface runoff from the Site has created erosion channels that drain into Rancocas Creek.

12. On October 28, 1986, the New Jersey Department of Environmental Protection's Division of Hazardous Waste Management and Central Bureau of Field Operations conducted sampling at the Site. Analyses of these samples identified DDT and tentatively identified DDT isomers in all five of the samples taken.

13. The concentrations of 4,4' DDT in the soil samples collected from the Site ranged from 170 ppm to 380,000 ppm. The tentatively identified DDT isomers ranged in concentration from 30 ppm to 340,000 ppm. The pesticides 4,4' DDD and 4,4' DDE were identified at the Site and tentatively identified isomers of these compounds, as well as alpha BHC, gamma BHC, endosulfan I, heptachlor epoxide, and parathion were also found. In addition, three samples contained arsenic ranging in concentration from 42 ppm to 160 ppm and one sample contained 23 ppm of thallium.

14. EPA personnel conducted a Site visit on January 22, 1990. During a Site investigation on February 10, 1990, EPA's Technical Assistance Team (TAT) performed on-site analyses for chlorinated organics. Results of these analyses confirmed the presence of chlorinated compounds.

15. Many of the substances referred to in the preceding paragraphs, including, but not limited to, DDT, DDD, and DDE are hazardous substances within the meaning of Section 101(14) of CERCLA, 42 U.S.C. 9601(14).

16. DDT and the other hazardous substances and contaminants that have been detected in the soil at the Site have the potential to migrate into the groundwater system in the area.

17. Studies have shown that many of the substances referred to in the preceding paragraphs can cause a variety of adverse, acute and/or chronic effects in exposed population groups. For example, DDT and its metabolites (DDD and DDE) are carcinogens in animals and are suspected of causing cancer in humans as well. DDT and its related compounds are extremely persistent and stable in the environment.

18. The observed releases of hazardous substances onto the soil at the Site (and into the adjacent stream (as noted above)) are actual releases within the meaning of Section 106(a) of CERCLA, 42 U.S.C. §9606.

19. The potential of these hazardous substances referred to in the preceding paragraphs to migrate in the air, soil, ground water or surface runoff constitutes a threatened release within the meaning of Section 106(a) of CERCLA, 42 U.S.C. §9696.

20. The actual and threatened releases described above are releases within the meaning of the term "release" as defined in Section 101(22) of CERCLA, 42 U.S.C. §9601(22).

21. The Respondent is a potentially responsible party within the meaning and the intent of Section 107(a) of CERCLA, 42 U.S.C. §9607(a).

22. The Site is a "facility" within the meaning of that term as defined in Section 101(9) of CERCLA, 42 U.S.C. §9601(9).

EPA DETERMINATIONS

23. Based upon the FINDINGS set forth above and the entire Administrative Record, EPA has determined that the release or threatened release of hazardous substances into the environment from the Site may present an imminent and substantial endangerment to the public health, welfare or the environment

within the meaning of Section 106(a) of CERCLA, 42 U.S.C. §9606(a).

24. A response action of the type contemplated by the National Contingency Plan, 40 C.F.R. Part 300 et seq., is required to be taken at the Site to prevent and/or mitigate any potential threat of harm to public health, welfare or the environment caused by the release or threatened release of hazardous substances from the Site.

ORDER

25. Based on the foregoing FINDINGS and DETERMINATIONS, EPA hereby orders and PPG has agreed to undertake response actions at the Walton Farm Site in accordance with all of the terms and provisions stated below.

26. Within seven (7) calendar days after the effective date of this Order, PPG shall select a person, to be known as the Facility Coordinator, and will submit his or her name, address, and telephone number to the EPA Project Officer identified in Paragraph 36 below. The Facility Coordinator shall be responsible for oversight of all onsite activities required by this Order.

27. The Site Operations Plan (SOP) for the activities at the Site is attached as Appendix 1. The SOP is hereby incorporated by reference into this Administrative Consent Order. All provisions and schedules of the SOP are enforceable as part of this Administrative Consent Order.

28. The activities the Respondent has agreed to perform pursuant to this SOP include, but are not limited to, the following:

A. under the Pre-Removal Sampling Plan, which is designed to obtain information sufficient to assess the horizontal and vertical extent of soil contamination for purposes of conducting a removal action at the Site, the following:

a. a detailed map of the Site depicting the location of all soil sampling locations;

b. a detailed map of the Site depicting the location of all stream water and sediment sampling locations;

c. the type and number of samples, collection methodology, and the analyses to be performed at each sampling station;

d. a Quality Assurance/Quality Control Plan for all investigations under this Order which shall comply with Section 10 of the EPA publication Test Methods for Evaluating Solid Waste (SW-846);

e. a Health and Safety Plan in accord with EPA regulations for the activities conducted under this Subparagraph; and

f. a schedule for the completion of the sampling.

B. under the Removal Work Plan, which is designed for conducting a removal action at the Site, consistent with the requirements of the NCP, to remove wastes and contaminated soils to a level of 10 mg/kg of DDT, the following:

a. a summary of the results of the Pre-Removal Sampling undertaken pursuant to Subparagraph A. above;

b. a description, based on the Pre-Removal Sampling, of any modifications in the location of the fencing and berms constructed at the Site, in conformance with Paragraph 29;

c. a detailed description, based on the Pre-Removal Sampling, of how and from what areas the removal will be conducted at the Site;

d. a discussion of the available alternatives for disposal of the material removed from the Site and a description of the interim storage of the material prior to such disposal;

e. a Health and Safety Plan in accord with EPA regulations for the activities conducted under this Subparagraph;

f. a discussion of Post-Removal Sampling, providing all of the elements required in the Pre-Removal Sampling Plan by Subparagraph A. above, to confirm that the removal objectives have been achieved;

g. a plan for backfilling and restoration of the excavated area;

h. a Community Relations Plan; and

i. a schedule for the completion of each of the tasks identified in this Subparagraph and for submittal of the Draft Site Report required in Paragraph 31.

C. If the results of the Pre-Removal Sampling show that contaminant levels in the tidal area sediment adjacent to the Site exceed background levels for these contaminants, EPA will determine if remediation of sediments would be appropriate. if remediation is determined to be appropriate, EPA will develop removal action levels ("RALs"). Based on these RALs, PPG and EPA will attempt to negotiate an amendment to the Removal Work Plan in Subparagraph B above to incorporate the remediation of the tidal sediments. Any such amendment to the Removal Work Plan will be incorporated into and be enforceable as a part of this Order upon written approval of such amendment by EPA and PPG. If PPG declines to perform these activities or if EPA and PPG cannot reach agreement on such amendment within a reasonable time, EPA retains the right to undertake further enforcement against PPG in another Order or action relating to these sediments. All other work required by this Order will, however, remain unaffected by any decision by PPG to either perform or not perform these sediment remediation activities or by the failure of the parties to negotiate an amendment to the Removal Work Plan relating to these activities.

29. PPG shall achieve the following within sixty (60) calendar days after the effective date of this Order, unless delayed by a force majeure event as defined in Paragraph 52 below:

A. installation of high visibility fencing around the area shown in Appendix 1 to this Order;

B. installation of deflection berms for drainage control at the Site and sediment control devices such as hay bales or silt fencing should be installed along the embankment bordering Rancocas Creek, as shown in Appendix 1 to this Order; and

C. placement of warning signs along the fence and in open conspicuous areas on the Site to give public notice of the hazardous conditions at the Site.

30. Within forty-five (45) calendar days after the effective date of this Order, Respondent will provide to EPA a

list of all contractors and subcontractors who will be performing work at the Site pursuant to this Order, including the specific activities that they will be performing.

31. Upon completion of all activities required under the SOP attached as Appendix 1, PPG shall submit to EPA a Draft Site Report in accordance with the schedule contained in the Work Plan. This Draft Site Report shall include, at a minimum, the following components:

A. a listing of all contractors that performed work for PPG under the SOP including a listing of all laboratories that analyzed the data presented in the Site Report, a description of the chain of custody procedures used by PPG, and the names of all entities who handled samples collected for these analyses at the Site;

B. a detailed description of the manner in which the excavation component of the removal activities were undertaken at the Site;

C. a description of how the excavated material was screened based on contaminant concentration and the manner in which it was ultimately disposed of off-site; and

D. a description of the Post-Removal sampling conducted and a presentation of the results.

32. EPA will review the Draft Site Report submitted by PPG for compliance with this Order, the National Contingency Plan, and other applicable Federal and State laws and regulations.

A. If EPA determines that the Draft Site Report complies with these laws and regulations and adequately addresses the items noted in this Order, EPA will approve the Draft Site Report. At such time as EPA determines that the Draft Site Report is acceptable, EPA will notify the Facility Coordinator in writing and that report will be deemed the Final Site Report. This EPA-approved Site Report shall be deemed incorporated into this Order and its terms, provisions and schedules shall then be enforceable as any other terms of this Order.

B. If EPA determines that the Draft Site Report requires modifications for compliance with this Order, the NCP, and other applicable federal and state laws and regulations, EPA will send comments, including modifications, in writing to

the Facility Coordinator. Within fourteen (14) calendar days of receipt of EPA's comments, PPG may request and shall be given an opportunity to meet with EPA to discuss such proposed modifications to the Draft Site Report. If such a meeting is held, PPG shall amend the Draft Site Report as required by EPA's comments or as otherwise agreed upon by EPA in writing, and shall submit the amended Draft Site Report to EPA within fourteen (14) calendar days of either such meeting or receipt of EPA's post-meeting written comments, whichever is later. If no such meeting is requested, PPG shall amend the Draft Site Report as required by EPA's written comments and shall submit the amended Draft Site Report to EPA within fourteen (14) calendar days of receipt of EPA's written comments on the Draft Site Report.

C. EPA's comments on the Draft Site Report may require PPG to perform additional work as EPA finds necessary. Such work (including any necessary work plans and reports) shall be performed by PPG in conformance with a reasonable schedule approved by EPA.

D. Subject only to the reservation of rights as set forth in Paragraph 33C, EPA shall be the final arbiter in any dispute regarding the sufficiency or acceptability of the Draft Site Report and supplementary submittals prepared in accordance with subparagraph c above, and EPA may modify them unilaterally.

33. PPG and EPA shall make reasonable efforts to resolve informally and in good faith all disputes or differences of opinion that arise with respect to the implementation of this Order.

A. If PPG, in good faith, disagrees in whole or in part, with comments made by EPA pursuant to Paragraph 32B or with a determination made pursuant to Paragraph 52, PPG shall notify EPA in writing of its objection as soon as possible, but not later than fourteen (14) calendar days after receipt of such comments or notice of such determination by EPA. If PPG so notifies EPA within the aforesaid period, the Director, Emergency and Remedial Response Division - EPA Region II, shall provide a written response to PPG setting forth EPA's position and the basis for that position. The written response of the Director, Emergency and Remedial Response Division

shall constitute the resolution of the dispute and shall be deemed to be incorporated in this Order.

B. If a dispute and its resolution, as described in subparagraph A above, cause a delay that makes it impossible for PPG to meet a deadline set forth in or established pursuant to this Order, then that deadline shall be extended by EPA by a period of time not to exceed the delay resulting from the dispute and its resolution; PROVIDED, that PPG shall not be entitled to any such extension if the Director, Emergency and Remedial Response Division, determines that PPG's disagreement with the comments specified above is not in good faith or otherwise lacks a reasonable basis. Notwithstanding any of the foregoing, if PPG requests an extension of a deadline set forth in or established pursuant to this Order, and if EPA declines to grant an extension in response to such a request, any delay, caused solely by the resolution of such a dispute shall not entitle PPG to an extension of time.

C. Notwithstanding any of the foregoing, EPA will be the final arbiter of all disputes under this Order and the final arbiter as to the sufficiency and acceptability of all work conducted pursuant to this Order. However, nothing in this Paragraph shall affect any rights that PPG may have to judicial review, if any, of EPA's actions or determinations under this Order, and, except as provided in Paragraph 65, EPA and PPG expressly reserve all rights and defenses that they may have pursuant to applicable law.

34. PPG shall provide the EPA OSC three (3) days advance notice of the commencement of any field activities undertaken pursuant to this Order.

35. PPG shall provide notice to local officials prior to the start of any work at the Site pursuant to the terms of this Order.

GENERAL PROVISIONS

36. Two copies of all work plans, reports, and any other documents required to be submitted to EPA under this Order shall be sent by certified mail, return receipt requested, or express mail to the following address:

Chief, Removal Action Branch
U.S. Environmental Protection Agency
2890 Woodbridge Avenue
Building 209
Edison, New Jersey 08837-3679

Att: Walton's Farm Project Manager

37. All documents produced by PPG and submitted to EPA in the course of implementing this Order shall be available to the public unless PPG claims they are confidential and EPA determines that they meet the confidential requirements stated in 40 CFR Part 2, Subpart B and Section 104 of CERCLA, 42 U.S.C. §9604. No sampling, hydrological, geological, soil chemical analyses or groundwater quality data relating to the Site shall be considered confidential.

38. EPA and its contractors and agents shall have access to all records relating to implementation of the work under this Order, except for records or documents that are protected as attorney-client communications or attorney work product. Notwithstanding the exceptions identified above, no information specified in Section 104(e)(7)(F) of CERCLA, 42 U.S.C. §9604, shall be withheld. All such records shall be made available to EPA upon request, and all employees of PPG, including contractors, who engage in activity under this Order shall be available to and shall cooperate with EPA.

39. All data and information relating to the implementation of this Order shall be retained by PPG for a period of ten (10) years after the effective date of this Order and shall be made available to EPA upon request during that period of time.

40. PPG shall allow unimpeded access to all areas of the Site and into all structures thereon by all EPA representatives, agents, contractors, and consultants to the extent that access agreement(s) obtained by PPG allows such access onto any and all areas of the Site. Consistent with its access rights PPG shall permit such EPA agents to enter and move about the Site at will at all times and shall allow such officials or agents of EPA to undertake any observations, response actions or any other activities which EPA elects to undertake at the Site at EPA's option.

41. PPG will use its best efforts to obtain all access agreements which are needed to implement the terms of this Order. If, after such efforts, PPG cannot obtain any particular access agreement which is required for implementation of the terms of this Order, PPG shall so notify the EPA Project Manager in writing and shall specify the real property in question and the efforts which PPG has taken to obtain entry onto the property in question. If EPA determines that access onto the parcel in

question is needed to implement any of the terms of this Order, EPA will make reasonable efforts to facilitate access by PPG to that parcel of land. However, PPG shall continue to implement all other terms of this Order which, in the view of EPA, can still be implemented regardless of the failure to obtain access to the parcel of land in question.

42. All reports, SOPs, Work Plans, Site Reports, and other writings required under the terms of this Order shall, upon approval by EPA, in writing, be deemed incorporated into and become a part of this Order.

43. No informal advice, guidance, suggestions or comments by EPA or DEP shall be construed to relieve PPG of any of its obligations under this Order.

44. All contractors and subcontractors PPG plans to use for work at the Site must have adequate liability coverage or indemnification for any liability which may result from any activities conducted onsite pursuant to this Order. Prior to commencement of onsite activities by PPG contractors and subcontractors, PPG shall require that their contractors and subcontractors provide to PPG such documents or other materials which indicate that the contractors and subcontractors have in effect, at the time of commencement of onsite activities and maintain in effect for the expected duration of onsite activities, liability coverage or indemnification as required in this Paragraph.

45. PPG may request that EPA approve modification(s) to the EPA-approved SOP or Site Report at any time during the implementation of the work required by this Order. Any and all such modifications to this Order must be approved in a writing signed by the Director, Emergency and Remedial Response Division, EPA - Region II.

A. EPA shall have sole authority to make any modification(s) to the EPA-approved SOP and Site Report and EPA may unilaterally make any such modifications. PPG reserves the right, however, to comment on or disagree with any modification(s) made by EPA to the SOP or Site Report. Any such comments from PPG on EPA modification(s) to the SOP or Site Report shall be set forth in either a footnote or an appendix to the modified document.

B. EPA alone shall be the final arbiter of any issues or disputes concerning the SOP or Site Report and all work which shall be required under this Order.

46. PPG shall provide monthly written progress reports to EPA. At a minimum, these progress reports shall: (1) describe

all action and activities undertaken toward achieving compliance with this Order, and (2) include all plans and procedures completed pursuant to the SOP during the preceding month as well as such action and plans which are scheduled for the next month. Three (3) copies of the monthly report shall be submitted to the EPA Region II Project Manager by the first Monday of each month following the effective date of this Order.

47. All work conducted pursuant to this Order shall be performed in accordance with prevailing professional standards.

48. PPG shall comply with all applicable provisions of the NCP, 40 C.F.R. 300.60 et seq., and all other applicable Federal and State statutes and regulations while performing all of the work required by this Order.

49. PPG shall comply with all applicable Federal and State health and safety requirements by all workers and agents of PPG who enter the Site, including compliance with all applicable regulations of the Occupational Safety and Health Administration (OSHA), as contained in 29 C.F.R. §1910 et seq. and elsewhere.

50. PPG shall be responsible for obtaining all necessary permits, licenses and other authorizations needed to carry out the work required by this Order.

51. The United States Government and any and all agencies thereof shall not be liable for any injuries or damages to any person or property resulting from any acts or omissions of PPG's officers, directors, employees, contractors or agents when carrying out any activity related to this Order; PPG shall not represent to anyone that the United States Government or any agency thereof is or may be a party to any contract entered into by PPG in carrying out any activity pursuant to this Order.

52. PPG shall use its best efforts to avoid or minimize any delay or prevention of performance of its obligations under this Order.

A. PPG shall perform all the work required by this Order within the time limits set forth herein unless performance is delayed by events which constitute a force majeure. For the purposes of this Order, a force majeure is defined as any event arising from causes beyond PPG's control. Increased costs or changed financial circumstances shall not constitute a force majeure.

B. PPG shall orally notify EPA as soon as possible after PPG becomes aware of any circumstances which have occurred or which are likely to occur which would constitute a force majeure. PPG will notify

the EPA Project Officer in writing no later than seven (7) days after PPG became aware of or, based upon a reasonable person standard, should have become aware of the event(s) which would or could constitute a force majeure under this paragraph. Such notification to EPA shall not relieve PPG of any of its obligations under this Order. Failure by PPG to provide either the oral notice or the written notice to EPA as required by this Paragraph shall act as a waiver to assert the occurrence of a force majeure as a defense to any proceedings for stipulated penalties under this Order.

C. In its notice letter to EPA, PPG shall fully describe the nature of the delay, the actions which will be taken to mitigate the delay and the timetable within such actions to mitigate any further delay will be taken.

D. PPG shall have the burden of proving that any requirement of this Order is excused by this force majeure provision. Any disputes regarding whether or not any event constitutes a force majeure shall be resolved in accordance with the dispute resolution provisions described in Paragraph 33.

53. PPG agrees to reimburse EPA for all Oversight Costs which are incurred by EPA and all of its agents, contractors and employees relating to this Order.

A. PPG and EPA agree that EPA's certified Agency Financial Management System summary data (SPUR) reports, or such other summary as certified by EPA, accompanied by a brief reasonable description of the bases for such costs, shall serve as the sole basis for payment demands by EPA.

B. EPA will periodically submit to PPG a demand for payment of Oversight Costs. PPG will reimburse EPA for all Oversight Costs incurred by EPA relating to this Order within sixty (60) calendar days after the date of any letter from EPA to PPG which demands that PPG pay such costs is received by PPG. PPG shall not demand any additional documentation beyond that specified in Paragraph A, above, as a prerequisite for making any payments demanded by EPA for oversight costs incurred pursuant to this Order. All payments by PPG to EPA pursuant to the terms of this Order shall be in the form of a cashier's check or a certified check made out in the amount demanded by

EPA and made payable to "Hazardous Substances Superfund"; all such checks shall be mailed to the following address:

EPA - Region II
Attn: Superfund Accounting
P.O. Box 360188M
Pittsburgh, PA 15251

All such payments shall be accompanied by a letter stating the name and address of PPG, the name of the Site, and the number on this Order. A copy of the letter and check must also be sent to the EPA Region II Project Officer at the address noted in Paragraph 36.

54. Any failure by PPG to carry out any terms of this Order may result in EPA unilaterally taking the actions required under this Order, pursuant to Section 104(a) of CERCLA, 42 U.S.C. §9604.

55. Any failure by PPG to comply with any provision in this Order, including, but not limited to, any failure to comply with any terms of the EPA-approved SOP or Site Report which are to be prepared pursuant to this Order, will be considered a violation of this Order. In such an event, EPA may elect to:

A. Demand that PPG cease work under the Order;

B. Use federal funds to complete the work required by the Order; and/or

C. Take any other action(s) authorized under federal law(s) or regulation(s).

56. Nothing stated in this Order shall preclude EPA from taking any additional enforcement actions, and/or any actions as it may deem necessary for any purpose, including the prevention or abatement of an imminent and substantial endangerment to the public health or welfare the environment arising from conditions at the Site.

57. If PPG fails to comply with any of the requirements or time limits associated with:

a. Completion of the activities described in Paragraph 29 within sixty (60) calendar days after the effective date of this Order; or

b. Completion of the Site Report on or before the date specified in the SOP and, unless such failure was caused by a force majeure event, as defined

above, or by an extension of time granted by EPA in writing, PPG shall be subject to a stipulated penalty to EPA in the amount(s) indicated below for each and every calendar day of noncompliance:

Days After Required Date	Penalty per Violation per Day
1 to 10 days	$ 500/day
11 days or more	$1000/day

Any such penalty shall accrue as of the first calendar day after the applicable deadline has passed and shall continue to accrue until the noncompliance is corrected. Such penalties shall be due and payable ten (10) calendar days after the date that PPG receives a written demand from EPA for such penalties. Payment of any such penalties to EPA shall be made payable to the "Hazardous Substance Superfund" in the same manner as stated in Paragraph 53B.

58. Nothing contained in this Order shall affect the right of EPA to pursue an action for civil penalties against any entity pursuant to Section 106(b) of CERCLA, 42 U.S.C. §9606, or the right of PPG to defend any such action brought against it.

59. Nothing contained in this Order shall affect the right of EPA to pursue an action against PPG, except for those costs which have been paid by PPG to EPA pursuant to Paragraph 53, or any other responsible party pursuant to Section 107 of CERCLA, 42 U.S.C. §9607, for recovery of any costs incurred by EPA relating to this Order and/or for any other response costs which have been incurred or will be incurred by the United States relating to this Site.

60. Nothing in this Order shall affect the right of EPA to enter any other Administrative Order on Consent and/or issue any other Order unilaterally to PPG (and/or any other responsible parties for the Site) pursuant to CERCLA to require the performance of any additional response actions which EPA determine are necessary for this Site.

61. Nothing herein shall act as a bar to, a release of, a satisfaction of or a waiver of any claim or cause of action which EPA has at present or which EPA may have in the future against any entity, including PPG, on any matters relating to this Site.

62. Nothing contained in this Order shall affect any right, claim, interest, defense or cause of action of EPA or PPG with respect to any entity which is not a party to this Order. Nothing in this Order constitutes a decision on pre-authorization

or approval of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. §9611(a)(2).

63. PPG agrees not to make any claim(s) pursuant to Sections 106(b)(2), 111 and/or 112 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9611, 9612, either directly or indirectly, for reimbursement from the Hazardous Substance Superfund for any costs incurred by PPG in complying with the terms of this Order.

64. At such time as EPA determines that the work required by this Order has been satisfactorily completed, the Director, Emergency and Remedial Response Division, EPA - Region II will notify PPG that the requirements of this Order have been satisfied. The provisions of this Order shall be deemed satisfied when PPG receives this written notice signed by the Director, Emergency and Remedial Response Division, EPA - Region II which states that all the actions required by this Order have been satisfactorily completed.

65. Nothing contained in this Order shall constitute an admission by PPG with respect to any factual finding or legal determination noted herein. However, PPG agrees not to contest any of the following in any proceeding in any federal court after the effective date of this Order:

A. the validity of this Order; and

B. the authority of the Regional Administrator of EPA Region II to enter into this Order.

PPG reserves all legal remedies and defenses otherwise available under federal law.

66. This Order shall become effective on the third day after the date it is signed by the Regional Administrator of EPA Region II as indicated below. All activities required pursuant to this Order with deadlines measured from the effective date shall be calculated from this effective date.

CONSENT

The signatory identified below certifies that he is fully authorized to represent PPG Industries, Inc. in this matter, to agree to the terms and conditions of this Order on behalf of PPG Industries Inc. and to bind PPG Industries, Inc. to all of the terms and conditions of this Order. The person who has signed below also represents that he has discussed this Administrative Order on Consent with officers and/or directors of PPG Industries, Inc. and that by his signature, PPG Industries, Inc. agrees to enter into this Order and to be bound by its terms.

For: PPG INDUSTRIES, INC.

E. B. Mosier

October 29, 1991
DATE

E. B. Mosier
PPG Industries, Inc.
One PPG Place
Pittsburgh, Pennsylvania 15272

SITE OPERATIONS PLAN
SECTION 2

PRE-REMOVAL SAMPLING AND ANALYSIS PLAN

WALTON'S FARM SITE
DELRAN, NEW JERSEY

Prepared for

PPG INDUSTRIES, INC.
Pittsburgh, Pennsylvania

Prepared by

ICF KAISER ENGINEERS, INC.
Pittsburgh, Pennsylvania

Revision: 2
Date: November, 1991

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1.0 INTRODUCTION

1.1 SAMPLING AND ANALYSIS PLAN PURPOSE

The Pre-Removal Sampling and Analysis Plan (SAP) for site characterization at the Walton's Farm Site in Delran, New Jersey, was developed by ICF Kaiser Engineers (ICF KE) for PPG Industries Inc. and intended for USEPA Region II review and approval with subsequent implementation by a PPG contractor. The intent of the plan is to provide the reviewer and the implementing team with sufficient details to help ensure that environmental monitoring data of known quality are collected to meet the intended data use and to provide the requisite qualifications of the proposed team. It should be understood throughout this plan that the scope of work will be implemented as proposed, but the implementation team, i.e., the samplers, drillers and laboratory, may be as stated in the plan or will be replaced with an equivalent or improved substitution subject to USEPA review and approval.

The purpose of the SAP is to assure reliable monitoring data by serving as the instrument of control for all field and analytical activities associated with the project. Stated for reference within the SAP are the analytical methods, sampling procedures, quality assurance policies, quality control criteria and reporting requirements that must be followed by all contractor personnel when carrying out their assigned responsibilities on the project. This SAP was prepared in conformance with the requirements as presented by the USEPA in the Region II CERCLA Quality Assurance Manual (October 1989). Additionally, the SAP was prepared to comply with the applicable New Jersey Department of Environmental Protection (NJDEP) quality assurance requirements. Providing this information in one document ensures that all pertinent information is disseminated to the project staff, managers and oversight personnel in a consistent format to meet the requirements set forth in the Administrative Consent Order (ACO).

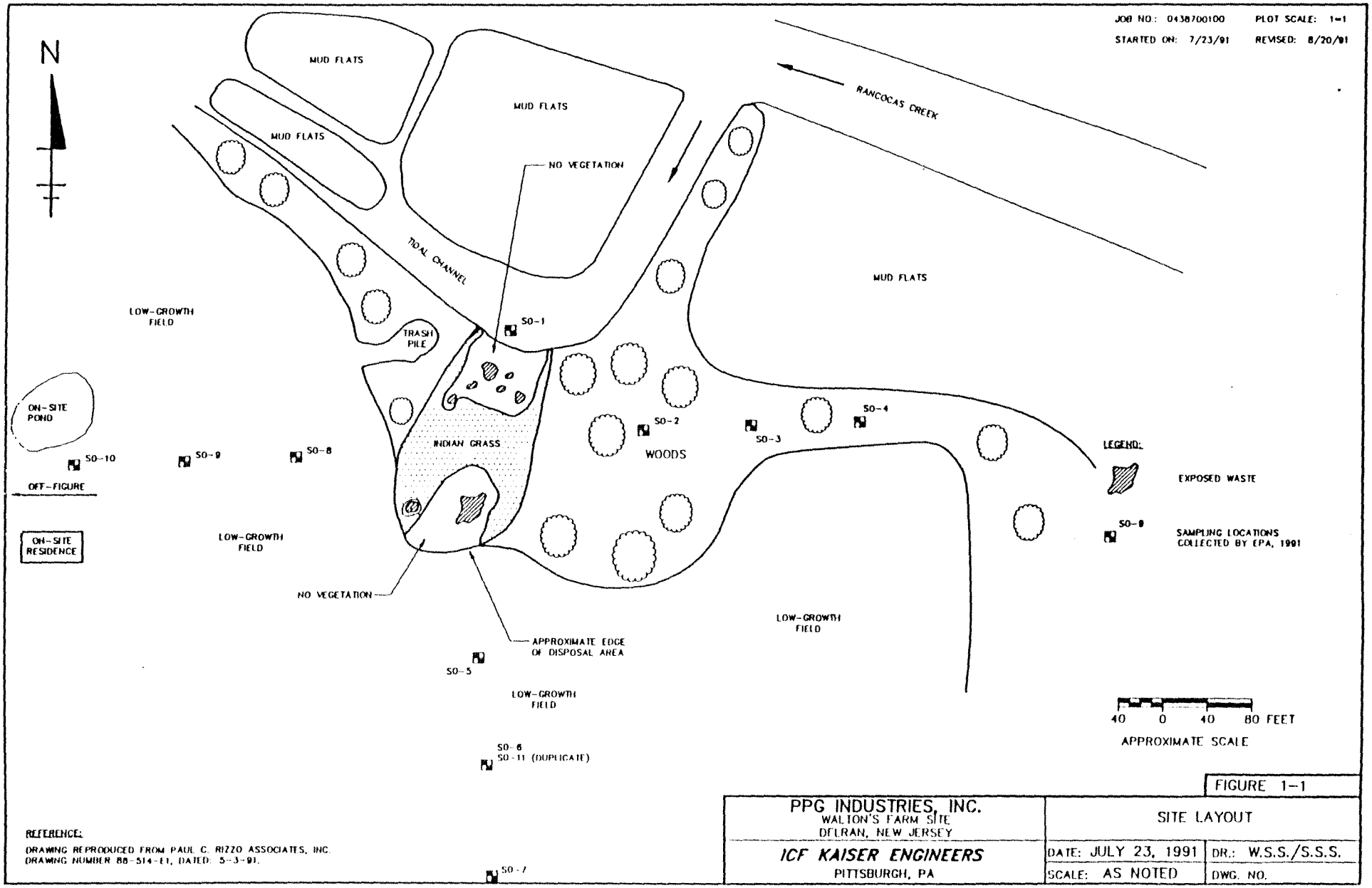
1.2 PROJECT BACKGROUND

1.2.1 Site Location and Layout

The Walton's Farm Site comprising 37.42 acres is located off Creek Road in Delran Township, Burlington County, New Jersey. The property was owned by Mr. Henry Walton from 1938 until his death in 1979 and is currently owned (since May 1985) by Dr. Rudolph Camishion. The property contains a one-story residence with associated pond and lawn areas, wooded areas along a tidal channel to the Rancocas Creek, low-growth fields and the former disposal area. Based on a July 22, 1991 site visit, the low-growth fields were apparently impacted by drought conditions and a lack of irrigation. The disposal area comprises of an area measuring approximately 100 by 200 feet, located in the north central portion of the property adjacent to the tidal channel to Rancocas Creek. The site layout is presented in Figure 1-1.

1.2.2 Site Use History

Evidence developed by the NJDEP appears to indicate that the Walton's Farm Site was used from approximately 1940 to 1952 for the disposal of wastes from a pesticide formulator, Pulverizing Services, located in Moorestown, New Jersey. PPG Industries, Inc. owned and operated the pesticide formulation plant from 1949 until the plant was closed in November 1963. Pulverizing Services reportedly routinely received, reprocessed, repackaged and distributed pesticides, herbicides, and fungicides to include aldrin, dichlorodiphenyltrichloroethane (DDT), dieldrin, endrin, lindane,


JOB NO.: 04387001.00
STARTED ON: 7/23/91
PLOT SCALE: 1=1
REVISED: 8/20/91
N
MUD FLATS
MUD FLATS
MUD FLATS
NO VEGETATION
TIDAL CHANNEL
RANCOCAS CREEK
MUD FLATS
LOW-GROWTH FIELD
TRASH PILE
SO-1
ON-SITE POND
SO-10
SO-9
SO-8
OFF-FIGURE
INDIAN GRASS
SO-2
WOODS
SO-3
SO-4
ON-SITE RESIDENCE
LOW-GROWTH FIELD
NO VEGETATION
APPROXIMATE EDGE OF DISPOSAL AREA
SO-5
LOW-GROWTH FIELD
SO-6
SO-11 (DUPLICATE)
SO-7
LOW-GROWTH FIELD
LEGEND:
EXPOSED WASTE
SO-8
SAMPLING LOCATIONS COLLECTED BY EPA, 1991
40 0 40 80 FEET
APPROXIMATE SCALE
REFERENCE:
DRAWING REPRODUCED FROM PAUL C. RIZZO ASSOCIATES, INC.
DRAWING NUMBER 88-514-E1, DATED: 5-3-91.
FIGURE 1-1
PPG INDUSTRIES, INC.
WALTON'S FARM SITE
DELRAN, NEW JERSEY
ICF KAISER ENGINEERS
PITTSBURGH, PA
SITE LAYOUT
DATE: JULY 23, 1991
DR.: W.S.S./S.S.S.
SCALE: AS NOTED
DWG. NO.

malathion, methoxychlor, pentachloronitrobenzene (PCNB), rotonone and sevin. During a portion of the time that Mr. Walton owned the property, the disposal site was apparently used for the disposal of off-specification products from the Moorestown facility, including DDT, sulfur and iron pyrites.

Evidence of apparent environmental contamination at the disposal site include soil discoloration and the absence of vegetation over areas of the former disposal site. Surface erosion has exposed physical signs of the dumping to include the paper bags used to repackage these materials and various glass reagent bottles. The odor of sulfur can be detected from the surface of the former disposal site.

1.2.3 Regulatory Agency History

In August 1986, the NJDEP Bureau of Field Operations performed a preliminary assessment (PA) of the property in response to a complaint lodged by Dr. Camishion to his local Assembly Person. The PA noted the potential for a public health and an environmental hazard to exist. In October 1986, the NJDEP returned to the site and collected five samples from the surface of the disposal area and analyzed the samples for the priority pollutant list of volatile organics, semivolatile organics, pesticides, polychlorinated biphenyls, total solids, metals, cyanide and phenolics. Analysis of these samples identified DDT and it's isomers in all five of the samples. The concentrations of 4,4'-DDT in the soil samples ranged from 170 to 380,000 ppm, and the isomers from 30 to 340,000 ppm. The isomers 4,4'-DDD and 4,4'-DDE were identified in the soils sampled as well as arsenic (42 to 160 ppm) and thallium in one sample at 23 ppm.

At the request of NJDEP, the USEPA Region II responded to the site by mobilizing the Technical Assistance Team (TAT) in January of 1991 to collect additional samples and to determine if a removal action was necessary to mitigate public health and/or environmental risk. On March 21, 1991 the TAT collected 10 surface soil samples at 100-foot intervals, west, south and east of the former disposal area in order to assess the extent of contamination and establish background concentrations. Six samples were collected from the surrounding field; three samples were collected in the wooded area east of the site; and one sediment sample was collected from approximately 15 feet north of the former disposal area, in the tidal channel at the base of the former dump embankment. These samples were analyzed for TCL pesticides and metals. The sampling locations are shown in Figure 1-1.

The compounds detected in the samples were arsenic, DDE, DDD and DDT. For each contaminant, the greatest concentrations were detected in the tidal channel sediment sample (SO-1). Four of the sampling locations (SO-1, SO-2, SO-3 and SO-5) appear to have been impacted by contamination. The other six sampling locations appear to adequately define concentrations in the vicinity of the site. Arsenic was detected in the six background samples at concentrations ranging from 4 to 7 ppm; DDD was not detected in background samples; DDE was detected in five of the six background samples at concentrations of 26 to 65 ppb; and DDT was detected in each background sample at concentrations ranging from 22 to 126 ppb. Soil samples collected from within the woods 100 - 200 feet east of the former disposal area and from the field 100 feet south of the former disposal area were reported to contain DDE and DDT concentrations that were elevated above background concentrations.

In November 1990, PPG Industries, Inc. received a General Notice Letter from the USEPA concerning their involvement with the site. In December, 1990, PPG Industries, Inc. responded to the USEPA, informing them of their willingness to perform a removal action at the Walton's Farm

Site. The purpose of the Pre-Removal Sampling Plan Program is to collect sufficient data to assess the horizontal and vertical extent of soil contamination for purposes of conducting the removal action at the site, thereby reducing the public health and environmental risks for the intended post-removal land use to acceptable limits within the guides of site remediation. A primary PPG Industries, Inc. objective of the removal action is to excavate, segregate and dispose within an acceptable minimum technology landfill, that material which meets landfill requirements prior to the May 8, 1992, Land Ban restriction deadline.

1.3 DATA NEEDS

Data needs have been identified for site characterization, the evaluation of public health and environmental risk and the evaluation of potential site remedies. The data needs identified are outlined as follows:

1.3.1 Site Characterization Data Needs

The primary focus of site characterization data needs includes the delineation of the nature and extent of contamination, definition and evaluation of contaminant migration pathways and the identification of potential contaminant receptors. Samples collected and analyzed to date have consisted of surface and subsurface soil samples from 6 to 8 feet below grade from within the former disposal area and background surface soil samples collected from the woods and field surrounding the disposal area. These data will be used as a baseline or guide for future sampling and will serve as the basis for developing the site conceptual model. Additional data are needed for surface and subsoils, sediment from the tidal channel, surface water from the on-site pond and groundwater as follows:

- Additional surface and near-surface soil data to quantify contaminant concentrations outside the visual denuded demarcation of the former disposal area.

- Additional surface and subsurface soil data surrounding the former sampling locations that contained elevated concentrations of DDT and its metabolites. These data will be used to define the volume of material with concentrations exceeding the noted action level.

- Surface soil data from within the surface erosion channels that connect the former disposal area to the tidal channel. Samples are needed from depositional areas where the channels extend outside the area proposed for removal. These data will be used to complete the pathway definition between the former disposal area and the tidal channel sediments and to further define the volume of affected material.

- Subsoil data from wherever the surface soil concentration exceeds the mandated removal level to further define the volume of affected material.

- Groundwater data from beneath the former disposal area to determine the effect of the site on local groundwater conditions. Additionally, physical aquifer data to define the groundwater flow regime.

- Surface water data from the on-site pond, Rancocas Creek and the tidal channel to define contaminant concentrations in potentially-affected media. Additionally, water level

measurements in the pond and in the tidal channel to assist in defining groundwater discharge/recharge under the various tidal conditions.

- Sediment data from despositional areas of the tidal channel and Rancocas Creek to quantify contaminant concentrations and volume of affected material within the channel and to complete the migration pathway assessment from the disposal area.

- Site survey and mapping to provide baseline topography for the removal action, to integrate the groundwater monitoring system to the State Plane Coordinate System and Mean Sea Level and to assist in defining surface and groundwater flow patterns.

1.3.2 Risk Assessment Data Needs

Risk assessment data needs for the Walton's Farm Site will focus on assessing the public health and environmental risk of the residual contaminants subsequent to the removal action. To determine and assess these risks, the contaminants-of-concern must be identified, the intended post-removal land use must be known, the pathways and receptors understood, and the risks quantified. Data needs identified to perform this risk assessment follow:

- Sufficient site characterization data to adequately define the source and receptor pathways for each of the contaminants of concern.

- Sediment data from the tidal channel and Rancocas Creek to define the risk to potential receptors and aquatic organisms and complete an environmental/ecological assessment.

- Surficial soil data from the field south of the site and the woods east of the site to evaluate the risk associated with direct contact or accidental ingestion of these soils by potential receptors.

- Subsoil data from beneath the area proposed for removal to quantify residual risk to future site developers.

- Groundwater data from on-site monitoring wells and from the on-site residential well to define risks to potential and current groundwater users.

- Surface water data from the on-site pond, Rancocas Creek and the tidal channel to define risks posed by the use of this water for irrigation and recreational purposes.

The detection limits required for the risk assessment data needs are low and should be within published regulatory limits where possible, i.e., they must meet the federal and state Applicable or Relevant and Appropriate Requirements (ARARs). Within the areas of very high DDT concentrations, it may not be possible to meet these requirements for all potential contaminants of concern due to the dilutions required to quantify the DDT concentrations.

1.3.3 Remedial Alternative Evaluation Data Needs

The designated remedial action for the contaminated material at the Walton's Farm Site includes excavation of the materials containing in excess of 10 ppm DDT and its metabolites. The excavated material will be placed in a secure landfill which meets minimum technology requirements if the

material is below the 1,000 ppm total halogenated organic compounds threshold, or destroyed in an approved thermal destruction unit. Additionally, if excavation of material from the tidal channel is needed, some type of flow restriction structure may be needed to allow for the excavation of sediments within the saturated zone. Therefore, the alternative evaluation data needs identified focus on the collection of data to support these two potential remedies.

- Geotechnical data to include grain size distribution and bearing capacity will be required for samples of a confining layer beneath the tidal channel sediment to evaluate the feasibility of constructing a flow cutoff wall to adequately reduce flow into the area of potentially affected sediment.

- Total halogenated organic compounds (HOCs) data are needed for soils from within and below the denuded area proposed for removal, to determine the feasibility of and percentage of the total excavated volume that could be placed in a landfill prior to May 8, 1992.

- Various landfill disposal acceptance data are needed for the material proposed for disposal to evaluate or confirm the applicability of the waste to a given landfill. Additionally, the concentration of metals must be known to properly evaluate the applicability of incineration as a means of waste destruction.

1.4 SAMPLING NETWORK DESIGN

The data needs identified for site characterization, risk assessment and alternative evaluation are combined in the sampling network, where applicable, for efficient collection and analysis. The combined data set was compared to existing federal and New Jersey ARARs to ensure that adequate data are collected to meet site-specific, chemical-specific and alternative-specific needs and that detection limits are designated to meet the requirements. The analytical approach and level of data quality objectives was selected to be consistent with the ultimate data use. Some assumptions which were made pertinent to the design of the sampling network are presented below.

- Although the clean up level presented in the ACO for the removal under USEPA Region II is 10 ppm for DDT, it is anticipated that the NJDEP may require cleanup levels less than that for site remediation of surface soils. A goal of this project is to complete the site characterization and site remediation in as few steps as possible; therefore, delineation of the extent of contamination will be to 3 ppm for DDT and 2 ppm for DDE and DDD in the surface soils (0 to 2 feet) and 10 ppm for the delineation in subsurface soils.

- Based on the low water solubility of the soil contaminants-of-concern and precedence established at other USEPA Region II/NJDEP sites, it is assumed that DDT would not be removed from below the seasonal average groundwater table. Therefore, site characterization of DDT concentrations below the water table will not be included in the sampling network.

- Sediments appear to have been contaminated by surface water or sediment runoff from the site. Existing data (Sampling Station SO-1) appear to be the result of sampling slumped surface soils from the adjacent former disposal area and not characteristic of tidal channel sediment concentrations. It is not anticipated that site remediation will include the removal of sediments from the tidal channel. However, in light of the potential for site-related

contaminants to impact aquatic resources, samples will be collected to support an ecological risk assessment to form the basis of a remedial decision.

1.4.1 Surface Soil Sampling

Surface soil sampling includes those samples collected from a depth interval having an upper limit from 0 to 6 inches below existing grade. Samples collected for analysis will be used to further define the visual denuded demarcation around the former disposal area, confirm and delineate the nature and extent of surficial contamination in the woods east of and in the field south of the former disposal area and to characterize the nature and extent of DDT contamination in the drainage channels. The proposed surface soil sampling locations are shown on Figure 1-2. The surface soil sampling network design is described as follows:

a) Confirm the visual denuded characterization/delineation of surface soil contamination around the perimeter of the former disposal area.

At eight proposed sampling stations, separated by 80-foot horizontal increments around the perimeter of the former disposal area, collect pairs of surface and near surface soil samples from 5 feet outside the visual denuded demarcation line. The 5-foot distance from the area void of vegetation was selected to compensate for the potential growth of vegetation along the perimeter where the concentrations of vegetation inhibiting contaminants might be somewhat reduced, yet exceed the proposed removal action level. The pairs of samples will be collected from 0 to 6 inches and 12 to 18 inches below existing grade. The samples will be analyzed for the Target Compound List (TCL) of pesticides, arsenic and thallium. The results will be compared to proposed action levels and to the concentration of contaminants from within the area proposed for removal. Because the data will be used for site characterization and risk assessment purposes, the data collected should be Data Quality Objectives (DQO) Level IV data.

b) Known or suspected "Hot Spot" Delineation of Nature and Extent.

At 23 proposed surface soil sampling stations surrounding the previously sampled soil sampling stations found to contain DDT and its metabolites concentrations at the surface which exceeded background, collect surface soil samples for analysis to determine the nature and extent of surface soil contamination. These samples will be collected from 25-foot and 50-foot increments to the north, south, east and west of former sampling stations SO-2 and SO-3, in the woods east of the former disposal area and around former sampling station SO-5 in the field south of the former disposal area. Samples will be collected from 0 to 6 inches from the surface and will be analyzed for the TCL pesticides, arsenic and thallium. These data will be used for site characterization and risk assessment purposes, and therefore will be generated at DQO Level IV. The data will be evaluated to determine if surface concentrations exceed the proposed action level; to assist in defining the potential source of this contamination outside the former disposal area (i.e., windblown dispersion, anthropogenic redistribution; to determine if these areas can be treated as segregated areas of contamination away from the former disposal area or if they must be treated, for purposes of the removal, as contiguous contaminated property with the former disposal area. The analytical results from these samples will also be used to define the appropriate location for the removal fencing.

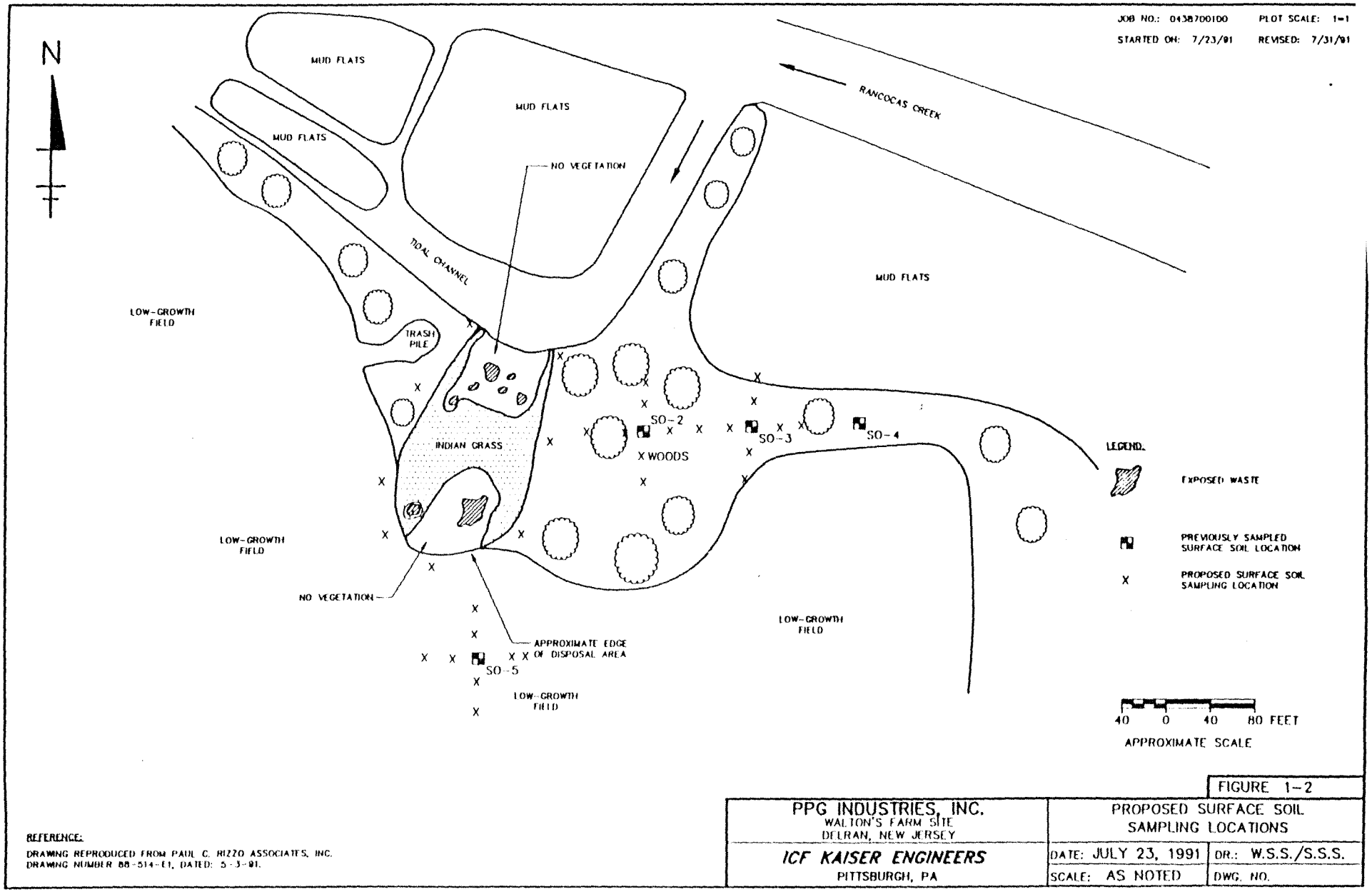


FIGURE 1-2

PPG INDUSTRIES, INC. WALTON'S FARM SITE DELRAN, NEW JERSEY	PROPOSED SURFACE SOIL SAMPLING LOCATIONS
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: JULY 23, 1991 DR.: W.S.S./S.S.S. SCALE: AS NOTED DWG. NO.

REFERENCE:
DRAWING REPRODUCED FROM PAUL C. RIZZO ASSOCIATES, INC.
DRAWING NUMBER 88-514-E1, DATED: 5-3-91.

Additionally, if it is determined that these soils do not exceed the proposed action level, the concentrations will be evaluated in the risk assessment to define the residual risks associated with an appropriate use of this land.

c) Erosional Channel Soils Delineation of Nature and Extent

At six sampling stations in the surface water flow erosional channels that extend from the former disposal area to the tidal channels, collect surface soil samples for analysis and determination of the nature and extent of contamination and to evaluate the contaminant migration pathway from the former disposal area to the tidal channel. Much of the erosional channels exist within the area proposed for removal and therefore, will be excavated during the removal. However, where these channels extend outside the visual denuded demarcation into the woods to the east and west of the former disposal area, concentrations of contaminants in the channels will be delineated. Two samples will be collected from each of the three channels from 0 to 6 inches of the surface to be representative of the material most likely to be carried by surface runoff to the tidal channel. The samples will be collected from depositional areas in the channel at locations outside the areas void of vegetation. The six samples will be analyzed for the TCL pesticides, arsenic and thallium. The data will be evaluated to determine if concentrations exceed the proposed 10 ppm action level, to determine if the channels represent a significant contaminant migration pathway to the tidal channel and if the material does not meet the action level, the values will be used in the risk assessment to characterize potential residual risk. DQO Level IV data will be generated for this effort.

1.4.2 Subsurface Soil Sampling

Subsurface soil sampling includes those samples collected from a depth interval having an upper limit greater than 12-inches from the surface. These samples represent soil concentrations that will not be readily available for dermal contact or ingestion, surface runoff or that might not directly affect the growth of vegetation at the surface. Subsurface soil samples will be collected to define the vertical extent of contamination in excess of the proposed action level, to define residual risk following the proposed removal action, to define physical properties of the subsurface soils for use in the remediation process and to provide physical and chemical properties of the materials proposed for disposal or thermal destruction. The proposed subsurface soil sampling locations are shown in Figure 1-3. The subsurface soil sampling network is described as follows:

a) Delineate the Vertical Extent of Subsurface soil Contamination.

At three to an estimated potential 13 sampling stations located beneath surface soil sampling stations that exceed the action level of 10 ppm, collect subsurface soil samples for analysis from two sampling depth intervals: 1.5 to 2.0-feet and 3.5 to 4.0-feet below grade. Visual identification of waste and locating groundwater or other unusual subsurface conditions noted in the field may be used to revise or augment the subsurface soil sampling program. Subsurface soil samples will be collected wherever the surface soil concentrations exceed the action level in an attempt to delineate the vertical extent of contamination in excess of the proposed action level. The initial three sampling locations will be beneath the former sampling locations SO-2 and SO-3 in the woods east of the former disposal area and beneath SO-5 in the field south of the former disposal area. The subsurface soil data collected from this effort will be used to help define the volume of material for the proposed removal. The volume data will be needed for cost estimating purposes and specification package preparation for the removal and transportation contractor. The samples will be analyzed for the TCL list of pesticides, arsenic and thallium. Additionally, one sample will be collected from a background

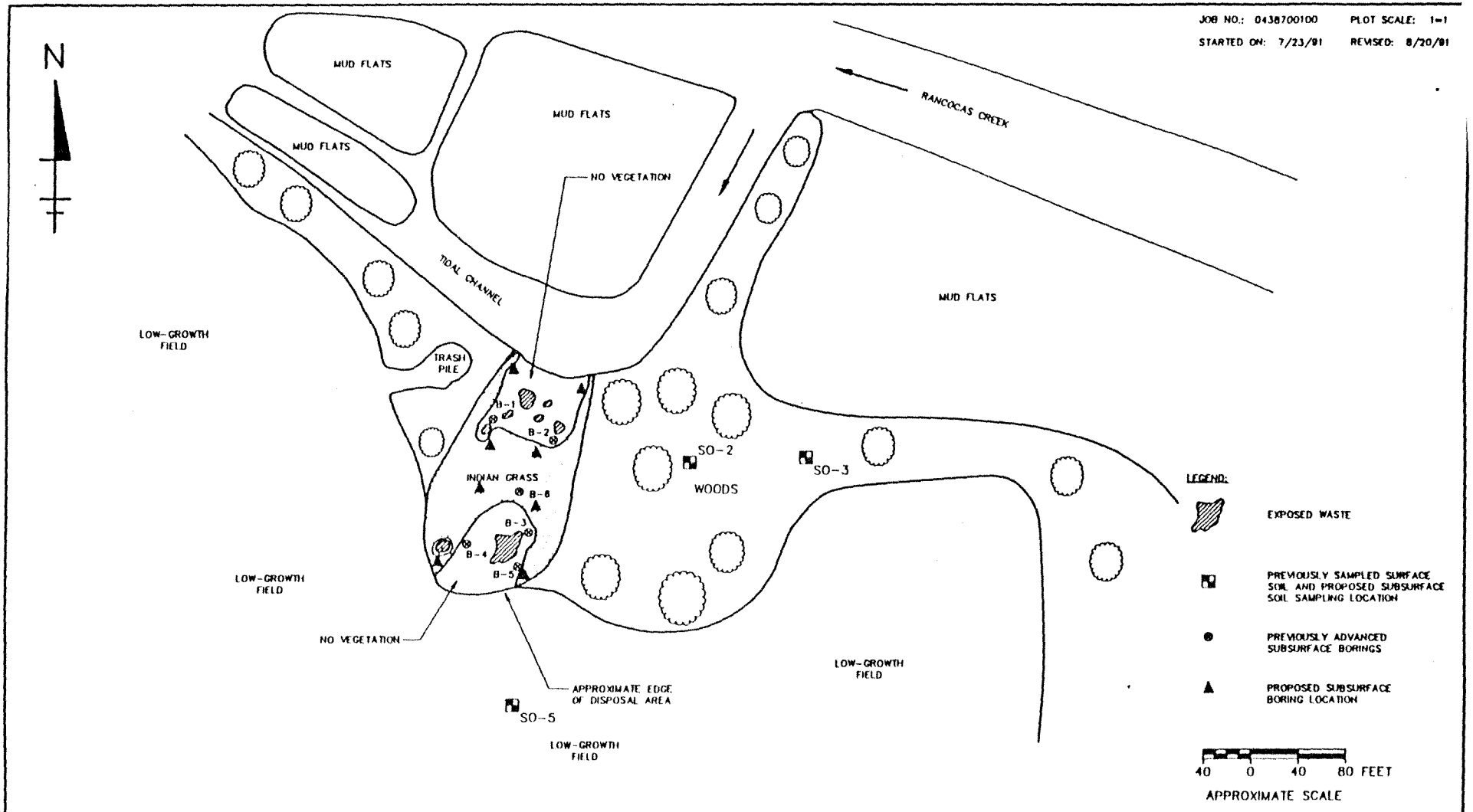


FIGURE 1-3

REFERENCE:
DRAWING REPRODUCED FROM PAUL C. RIZZO ASSOCIATES, INC.
DRAWING NUMBER 88-514-E1, DATED: 5-3-91.

PPG INDUSTRIES, INC. WALTON'S FARM SITE DELRAN, NEW JERSEY	PROPOSED SUBSURFACE SOIL SAMPLING LOCATIONS	
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: JULY 23, 1991	DR.: W.S.S./S.S.S.
	SCALE: AS NOTED	DWG. NO.

location for full TCL/TAL analysis to augment the existing analytical data base and fully characterize the indigenous soils. Sample results will be used for risk assessment and site characterization and, therefore, will be analyzed and reported at DQO Level IV. Those samples from the lowermost collection interval that do not exceed the action level will be used to characterize the residual public health and environmental risk for the subsurface source and receptor pathway.

b) Determine the Extent of Contamination in Soils Below the Vertical Limit of Waste Deposition

At eight sampling locations within the main area of disposal, (Figure 1-3), subsurface soil samples will be collected to define the level of contamination of soils below the vertical limit of waste disposal and to determine the method by which these materials may be disposed. Additional data will be collected to provide waste characterization data for obtaining approval for disposal at a commercial disposal facility.

Subsurface sampling will proceed at the proposed locations via hollow stem auger drilling with continuous split-spoon sampling from a track-mounted drill rig. Each boring will be visually logged to identify subsurface lithology, depth of waste deposition and occurrence of groundwater. Three consecutive split-spoon samples will be collected for chemical analysis from each boring beginning with the sample encountering the waste/underlying soil interface. Split-spoons and auger flights will be decontaminated between samples and borings, respectively, to minimize the potential for cross-contamination.

A total of 24 samples are anticipated for chemical analysis. Twenty of these samples will be analyzed for the TCL pesticides, arsenic and thallium. Four of the samples that visually appear to represent worst case conditions will be analyzed for the RCRA list of HOCs to demonstrate the relationship between the concentrations of pesticides and total HOCs. One sample will be analyzed for the full TCL/TAL to augment the existing data base and fully characterize the soils in contact with the waste, prior to the removal.

To complete pre-disposal approval applications for commercial disposal facilities, two of the four worst-case samples will also be analyzed for total RCRA metals, pH, ignitability, reactivity and toxicity with analysis for TCLP leachates for RCRA metals, thallium, volatile organics, semivolatile organics and pesticides.

c) Provide Design Data for the Design of a Tidal Channel Cutoff

As noted previously, significant excavation of tidal channel sediments is not anticipated. A possibility does exist, however, that contaminated soil or waste has sloughed off the bank and fallen into the channel. Additionally, the process of excavating the waste disposal area may result in additional material falling into the tidal channel. To minimize the impact on the tidal channel from these activities, a sheet pile cutoff wall may be installed to isolate the flow in the tidal channel from the potentially-affected area allowing excavation of the contaminated material in the isolated area with minimal impact to the channel.

To design an effective cutoff wall, subsurface soil samples will be collected to obtain physical properties of the overburden. The borings drilled for the two northernmost groundwater monitoring wells to be installed as discussed in Section 1.4.4 will be advanced beyond the desired depth of the

wells to locate consolidated bedrock or a confining layer suitable for supporting the cutoff wall. The borings will be advanced a maximum of 50 feet below grade in this effort. Shelby tube samples will be collected from the proposed confining strata. Upon completion of sampling activities, the borings will be tremie grouted back to the desired depth of the groundwater monitoring wells in accordance with NJDEP procedures.

Collected soil/rock samples will be analyzed for a variety of parameters including grain size distribution, in-situ permeability, shear strength and bearing capacity. These data will be used to support design calculations for the cutoff wall.

1.4.3 Sediment Sampling

The tidal channel immediately to the north of the former disposal area receives groundwater discharge and surface water and sediment runoff from the unvegetated surface of the disposal area. Former sampling station SO-1 was found to contain in excess of 1,000 ppm DDT in the sediment. Based on the sampling location, i.e., at the toe of the barren slope from the former disposal area, and depending upon the time of day the sample was collected (high versus low tide), this concentration may be more characteristic of slumped soil from the surface of the disposal area than tidal channel sediment. Although it is not anticipated that site remediation will include the sediment in the tidal channel, collection of samples and analysis is required for contaminant migration pathway characterization and for environmental/ecological and public health risk assessment purposes. The proposed sampling locations are shown on Figure 1-4. The sediment sampling network is described as follows.

a) Delineation of Contaminant Concentrations in the Tidal Channel Sediments.

At seventeen sampling stations within the tidal channel adjacent to the former disposal area, and in Rancocas Creek, collect sediment samples from the top six inches of sediment in depositional areas. The samples will be collected from 10, 20 and 30 feet downstream of the former sampling location SO-1, at an up-stream location out of the potential influence of the disposal area, up-stream in the tidal channel at the inflow confluence with the Rancocas Creek, upstream a minimum of 200 yards from the confluence with the tidal channel and downstream of the tidal channel in Rancocas Creek and on various representative mud flats. All samples will be collected from depositional areas during low tide conditions. All samples will be analyzed for the TCL pesticides, arsenic and thallium. These data will be used to characterize the level of contamination in the sediment, calculate the affected volume of material and complete the groundwater discharge and surface water runoff source receptor migration pathways. A representative group (5) will be analyzed for TOC and Grain Size for use in the assessment of contaminant migration and bioavailability. Additionally, the data will be used in the public health and environmental risk assessment to quantify the risks of residual contamination. DQO Level IV data will be generated for risk assessment and site characterization data use.

1.4.4 Groundwater Sampling

Although the contaminants of concern possess very low water solubilities, waste may be in contact with the groundwater beneath the disposal area. As such, the extent of potential influence will be investigated. The proposed groundwater monitoring well locations are shown on Figure 1-5.

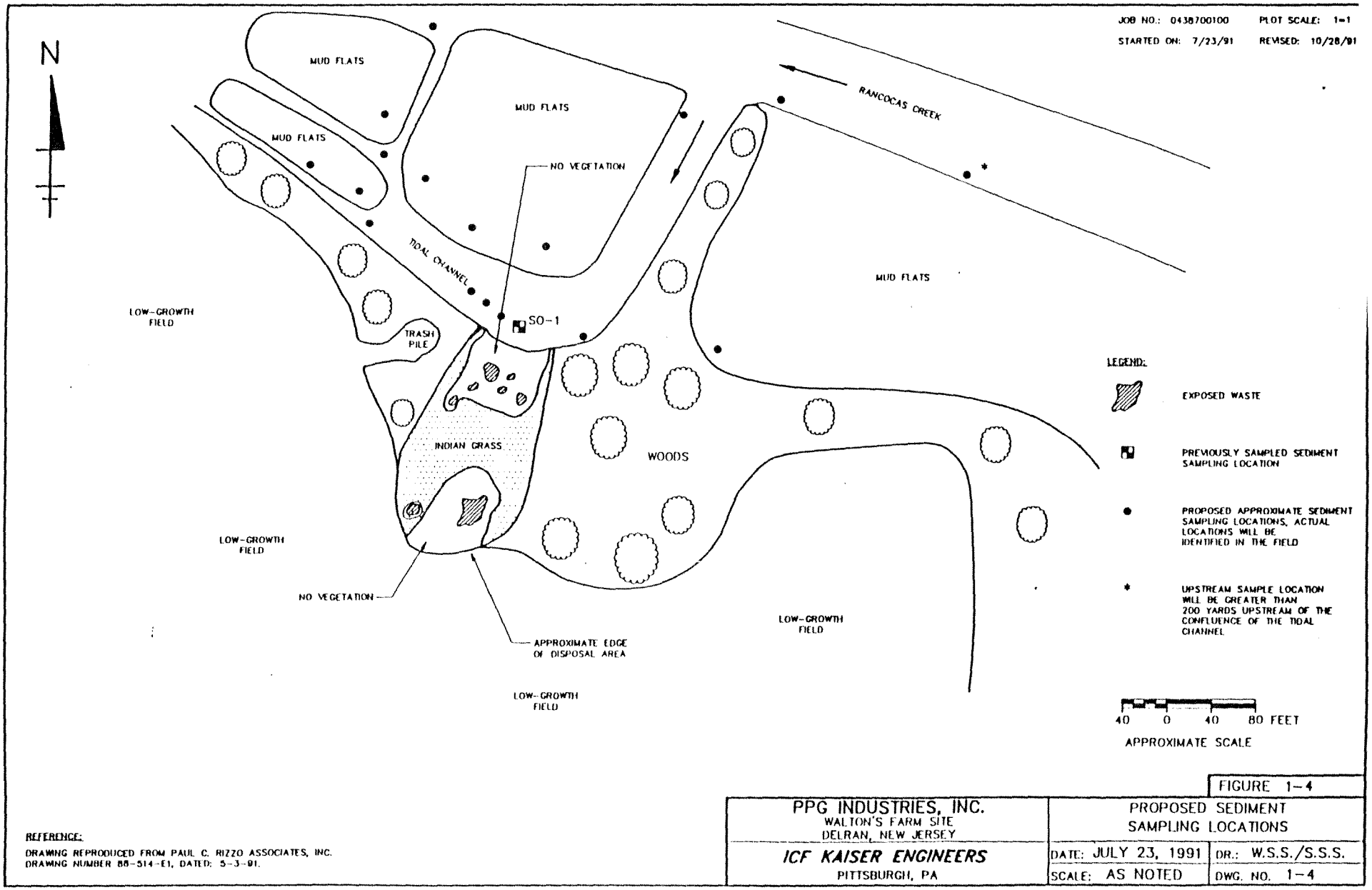
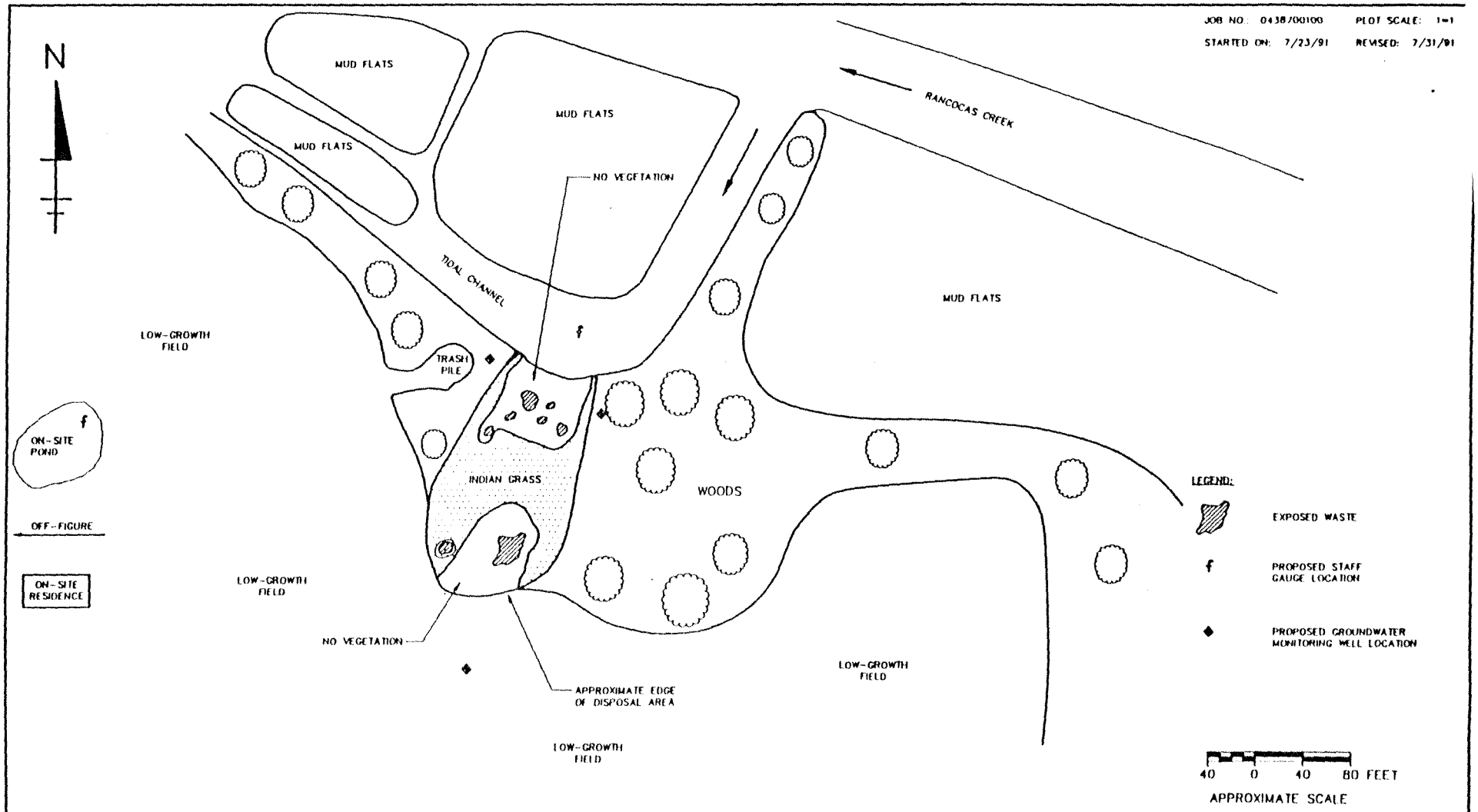


FIGURE 1-4

PPG INDUSTRIES, INC. WALTON'S FARM SITE DELRAN, NEW JERSEY	PROPOSED SEDIMENT SAMPLING LOCATIONS
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: JULY 23, 1991 | DR.: W.S.S./S.S.S. SCALE: AS NOTED | DWG. NO. 1-4

REFERENCE:
DRAWING REPRODUCED FROM PAUL C. RIZZO ASSOCIATES, INC.
DRAWING NUMBER 86-514-E1, DATED: 5-3-91.



REFERENCE:
DRAWING REPRODUCED FROM PAUL C. RIZZO ASSOCIATES, INC.
DRAWING NUMBER 88-514-E1, DATED: 5-3-91.

FIGURE 1-5

PPG INDUSTRIES, INC. WALTON'S FARM SITE DELRAN, NEW JERSEY	PROPOSED GROUNDWATER MONITORING WELL LOCATIONS
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: JULY 23, 1991 | DR.: W.S.S./S.S.S. SCALE: AS NOTED | DWG. NO.

The groundwater sampling network design is described as follows:

a) **Define the Nature and Extent of Groundwater Contamination beneath the Former Disposal Area.**

Three groundwater monitoring wells will be installed and surveyed for horizontal location and vertical elevation near the former disposal area. Two of the wells will be installed to the northeast, respectively, and northwest of the former disposal area in what is thought to be a downgradient position during low tide conditions. The third well will be installed south of the former disposal area, approximately midway between Creek Road and the disposal area. Drilling will be performed using hollow stem auger drilling techniques with continuous split-spoon soil sampling. The groundwater monitoring wells will be constructed of 4-inch PVC casing installed with a 5-foot screen in the shallow aquifer beneath the site. It is anticipated that groundwater will be encountered from 6 to 10 feet beneath the existing ground surface. Additionally, two staff gauges will be installed and surveyed to monitor surface water elevations and to assist in the evaluation of groundwater flow and discharge. The staff gauges will be installed in the tidal channel and in the on-site pond to the west of the former disposal area. Groundwater flow direction and/or gradients may fluctuate during the various tidal cycles resulting in contaminant migration pathway variability. To evaluate the effect of tides on the groundwater flow, water levels will be measured in the wells at three consecutive high and low tides.

The three newly-installed wells, as well as the on-site residential well, will be sampled and analyzed for the TCL pesticides and volatile organics, arsenic and thallium. DQO Level IV data will be generated for risk characterization. DQO Level II data (pH and conductivity) will be generated in conjunction with well development and sampling to confirm complete development and sample representativeness of the wells prior to sampling. The wells will be located so that they will not be impacted by the removal and can be utilized for post-removal groundwater monitoring, as needed.

1.4.5 Surface Water Sampling

The water solubility of the contaminants-of-concern at the Walton's Farm Site is very low. As such, it is not anticipated that any of the contaminants will migrate to and/or be present at measurable concentrations in the tidal channel water or Rancocas Creek. However, because the pond is currently being used as a source of spray irrigation water, contaminant characterization of the water is appropriate. Additionally, as instructed by the USEPA Biological Technical Assistance Group, confirmation of the lack of contaminants in the tidal channel and Rancocas Creek is also appropriate. The surface water sampling network design is described as follows:

a) **Chemical Characterization of the Surface Water in the On-Site Pond.**

One surface water sample will be obtained from the on-site pond during the sampling of the groundwater monitoring wells. The sample will be analyzed for the TCL pesticides and volatile organics, arsenic and thallium. The data results will be compared to the groundwater sampling results and the groundwater flow patterns to evaluate the potential for geochemical transport of contaminants-of-concern. Additionally, if site-related contaminants of concern are identified in the water sample, the data will be used in the risk assessment to determine the risks under likely exposure scenarios. DQO Level IV data will be generated for risk assessment purposes.

b) Chemical Characterization of the Surface Water in Rancocas Creek and the Tidal Channel.

Three surface water samples will be obtained from Rancocas Creek, upstream and downstream of the in-flow and out-flow of the tidal channel and downstream of the site in the tidal channel prior to the confluence with Rancocas Creek. These samples will be analyzed for TCL pesticides and volatiles, arsenic and thallium. If site related contaminants of concern are identified in the water samples, the data will be used in the ecological and public health risk assessment to determine the risk under likely exposure scenarios. DQO Level IV data will be generated for site characterization and risk assessment purposes.

1.4.6 Site Survey and Mapping

A baseline map of the Walton's Farm Site will be established to provide a basis of locating sampling points and sampling grids, groundwater monitoring wells and excavation limits for the removal action. The basis for the baseline map will be an aerial photography survey with an appropriate level of ground control. A digitized, photo-interpreted reproducible mylar topographic base map will provide the basis for future site characterization and removal design figures. The base map will show cultural features to include contours and drainage features at a map scale of 1 inch equals 50 feet and a vertical contour interval of 2 feet. The digital map model will also be prepared in AUTOCAD format as a basis for all future design. Elevations will be tied to the State Plane Coordinate System and Mean Sea Level. An inter-visible pair of permanent monuments will be maintained on-site with benchmark elevations for surveying the staff gauge and groundwater monitoring well locations. All wells will be surveyed to provide horizontal coordinates to third-order accuracy and elevations to the closest 0.01 feet. The staff gauges will be surveyed for vertical elevation to 0.01 feet.

1.4.7 Summary of Proposed Sampling Network

The pre-removal site characterization investigation will involve a variety of data collection. Tables 1-1 and 1-2 present a summary of the data proposed for collection, the analysis proposed, the intended use for the data and the intended data quality objective level. Table 1-1 presents the field engineering measurements, while Table 1-2 summarizes the environmental media sampling and analysis. In general, the field-generated data such as pH, conductivity, and water temperature will be generated at DQO Level I or II. Data intended for use in the assessment of risk will require DQO Level IV, data characterized by rigorous QA/QC protocols and documentation.

1.5 PROJECT SCHEDULE

A primary objective of this project is for PPG Industries, Inc. to expedite the project schedule so that material from the removal, which meets the landfill requirements will be removed from the Walton's Farm Site and placed in a secure landfill prior to the May 8, 1992 land ban waste exclusion deadline. As such, all field activities and reporting required prior to the removal will be performed in an expedited fashion. The proposed project schedule is presented as Figure 1-6. Key milestones include the following:

1. Draft Pre-Removal SAP and Removal Work Plan submitted to the Agency — August 23, 1991

2. Response to Draft Plans — September 20, 1991

3.	Agency Approved SAP	October 11, 1991
4.	Initiate Site Mobilization	October 14, 1991
5.	Initiate Field Work	October 21, 1991
6.	Complete Field Work	November 22, 1991
7.	Submit Draft Site Characterization Report and Final Removal Work Plan	December 20, 1991
8.	Approved Removal Work Plan	January 24, 1992

LE 1-1

SUMMARY OF PROPOSED SAMPLING NETWORK
(Field Engineering Measurements)
WALTON'S FARM SITE

TASK	DATA OBTAINED	DATA USED	DQO LEVEL
Test Borings	- SPT data (1) - Boring Logs (2) - Soils for Physical Testing - -- Particle Size -- Bulk Density -- Moisture Content	- Geologic Characterization - Geologic Cross-Sections - Remedial Alternative Evaluation - Contaminant Transport Modeling	I I II
Field Measurements	- Groundwater and Surface Water Level Data - pH - Conductivity - Water Temperature	- Estimation of Hydraulic Gradients - Estimation of Flow Velocities - Contaminant Transport Evaluation - Evaluation of Well Purge Water	II
Surveying	- Monitoring Well Elevations - Surface Water Stage Elevations - Sample Locations	- Basis for Site Mapping - Basis for Locating Sampling Points - Means to Integrate to MSL - Basis for Engineering Design Calculations	I

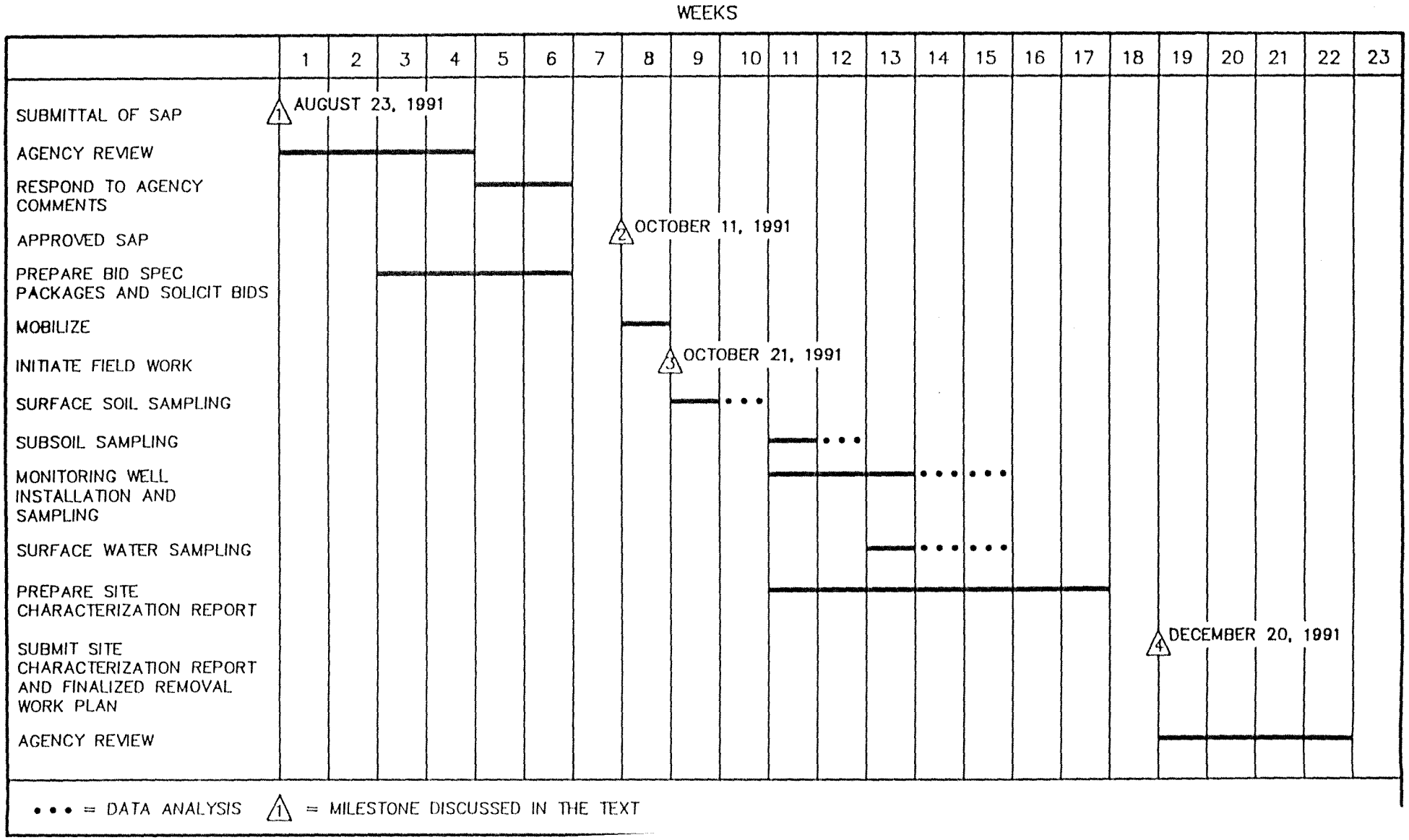
(1) SPT - Standard Penetration Testing in accordance with ASTM D1586-84
(2) Soil descriptions according to the Burmiester Classification System

TABLE 1-2
SUMMARY OF PROPOSED SAMPLING NETWORK
(Environmental Media Samples)
WALTON'S FARM SITE

Task	No. of Samples[1]	Analysis	Data Use	DQO Level
Surface Soil Sampling	45	TCL Pesticides, As, Tl	- Waste Area Perimeter Delineation - "Hot-Spot" Delineation - Drainage Channel Characterization - Risk Assessment for Residuals	IV
Subsurface Soil Sampling	6 to 26	TCL Pesticides, As, Tl	- Delineate Vertical Extent of Contamination Outside the Limits of the Disposal Area - Risk Assessment for Residuals	IV
	24	20 - TCL Pesticides As, Tl 2 - HOCs, As, Tl	- Delineate Extent of Soil Contamination Below Vertical Limit of Waste Deposition	IV
		2 - HOCs, As, Tl, Waste Characterization Parameters	- Provide Pre-Disposal Characterization for Commercial TSD Facilities	IV
Groundwater Sampling	4	TCL Pesticides and Volatiles, As, Tl	- Chemical Characterization of the Aquifer. - Risk Assessment	IV
Surface Water Sampling	4	TCL Pesticides and Volatiles, As, Tl	- Chemical Characterization of On-Site Pond, Tidal Channel and Rancocas Creek - Risk Assessment	IV
Sediment Sampling	12	TCL Pesticides, As, Tl, TOC, Grain Size	- Characterize Contamination in the Tidal Channel and Rancocas Creek Sediments - Risk Assessment	IV

(1) Does not include duplicates and blanks

FIGURE 1-6
PROJECT SCHEDULE
PRE-REMOVAL SAMPLING AND ANALYSIS PLAN
WALTON'S FARM SITE



2.0 PROJECT ORGANIZATION

This project organization provides the general guidelines for the project team structure for the implementation of the sampling plan and finalization of the removal work plan. As an example, ICF Kaiser Engineer personnel are provided to illustrate the role of the various project team members. It should be assumed by the reader that an equivalent contractor and subcontractors could be substituted and not negatively impact the project quality or schedule. PPG Industries, Inc. reserves the right to select the contractor for implementation of this plan. Any change in contractors, from that presented in this plan will be done with the prior review and approval of the USEPA prior to implementation of the plan.

2.1 PRIME CONTRACTOR ORGANIZATION

The Prime Contractor will report directly to PPG Industries, Inc. during the Walton's Farm Site pre-removal site characterization. PPG reports directly to the USEPA Region II On-Site Coordinator Mr. Donald Graham or Ms. Patricia Hicks, and has overall responsibility for ensuring compliance with the ACO requirements.

The Prime Contractor (ICF KE) will assume overall responsibility for QA. ICF KE will provide guidance and coordinate all QA activities, conduct all field sampling, monitor the performance of all subcontractors, perform data validation and prepare project reports. Key personnel for the Walton's Farm Site pre-removal site characterization are illustrated in Figure 2-1. Appendix A provides the Resumes of Key Personnel.

The analytical subcontractor, AnalytiKEM, will retain responsibility for all bench level QA/QC, data reduction, data reporting and analytical performance monitoring. Separate organization charts and resumes are supplied by the laboratory and presented in Section 3 of the Site Operations Plan.

Key personnel and their authority and responsibilities with respect to QA functions are briefly described as follows:

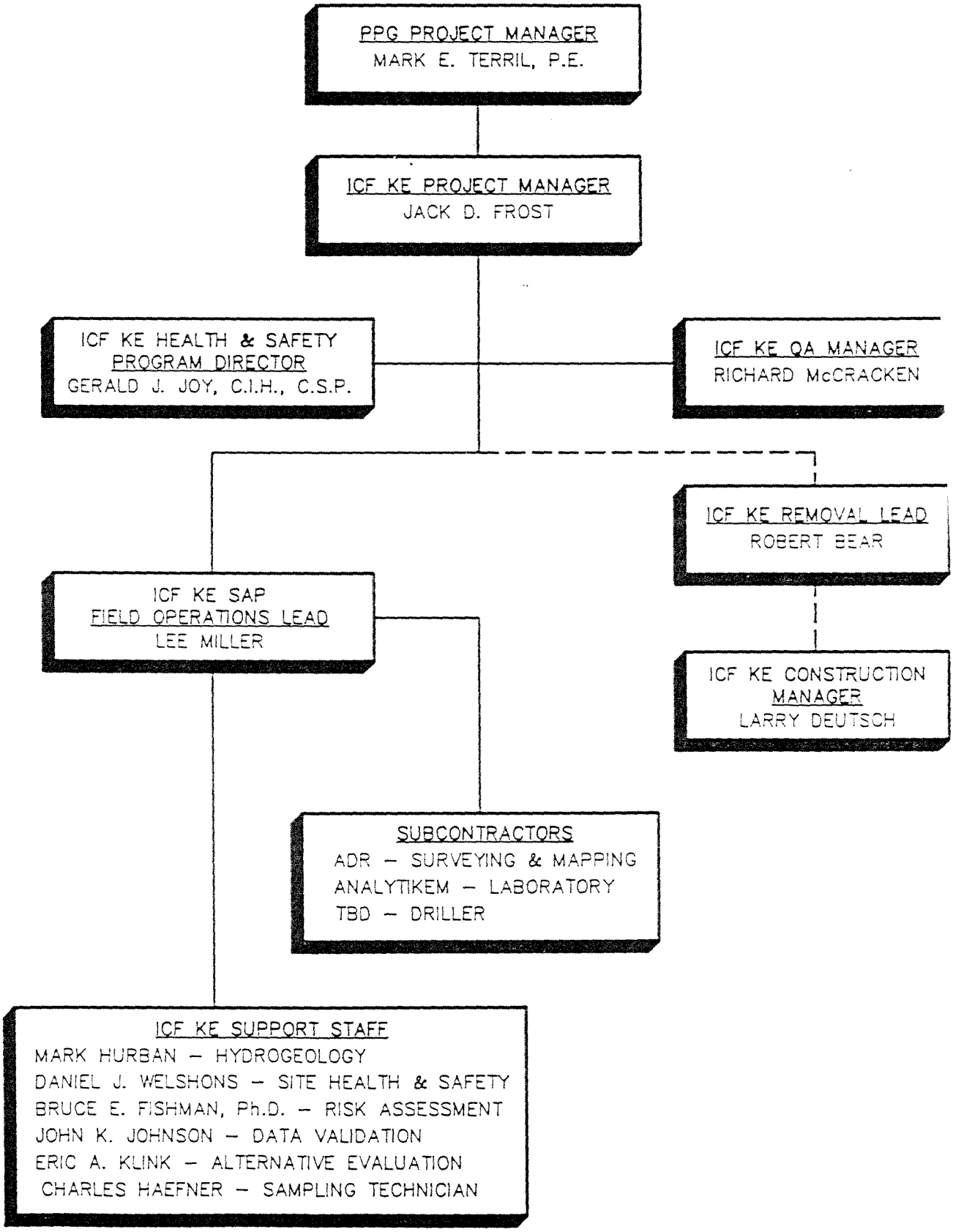
PPG Project Manager - Mr. Mark E. Terril, P.E.: (Telephone 412/492-5532)

The PPG project manager will act as a contact with the USEPA for all matters concerning the ACO and shall be the agent for the purpose of service for all matters concerning the ACO.

ICF KE Project Manager - Mr. Jack D. Frost: (Telephone 412/788-9200)

The contractor project manager assumes overall responsibility for project cost, schedule and quality. He also interfaces with project staff, PPG, USEPA, and the corporate QA and Health and Safety organizations. The contractor project manager has the authority and responsibility to implement corrective actions based on findings or recommendations from the QA, H&S or USEPA oversight staff. The contractor project manager has the authority to plan, schedule and assign personnel to field tasks to most appropriately meet specific project needs. The project manager is the only person who can approve major changes to the sampling and analysis plan (with prior approval of PPG and USEPA). The project manager also has the authority to require corrective action by subcontractors for work not performed in accordance with the approved SAP.

FIGURE 2-1
KEY PERSONNEL ORGANIZATION
WALTON'S FARM SITE
PRE-REMOVAL SITE CHARACTERIZATION



Mr. Frost has a M.S. in soil chemistry and is a senior project manager for ICF KE. He has over 10 years of experience performing and managing hazardous waste management projects, including site investigations in New Jersey, for public and private sector clients.

ICF KE QA Manager, Mr. Richard McCracken: (Telephone 412/788-9200).

The QA Manager (QAM) reports to the project manager through a chain of command that is separate from the project staff to avoid conflicts of interest. The QAM will be responsible for field sampling system audits, analytical subcontractor surveillance, data reporting and data validation supervision. The QAM will also have the responsibility of reviewing and approving proposed modifications to standard operating procedures as specified in the SAP. The QAM has full authority to require corrective action when field operations are found to be at odds with the approved SAP. If it is determined that field screening (mobile laboratory) is the analytical method of choice, the QAM will oversee the pilot study and approve the method for use. The data validation organization is described in Section 2.3. The QAM has the authority to and will advise the project manager when subcontractor performance is not in accordance with the approved SAP. The project manager will take appropriate corrective action to ensure that the subcontractor is working within the specifications stated in the approved SAP.

Mr. McCracken is presently serving as the QA Director of the ICF KE Pittsburgh office. He has a B.S. in chemistry, has performed organic and inorganic laboratory analysis, is trained and certified in data validation in Region II, has performed data validation for more than 30 EPA Superfund sites, and has served as the QA Manager on numerous CERCLA and RCRA site investigations.

ICF KE SAP - Field Operations Lead, Mr. Lee Miller: (Telephone 412/788-9200)

The Field Operations Lead (FOL) is responsible for coordinating and directing the technical efforts of the project staff and subcontractors in conducting the site field investigation. The FOL is responsible for disseminating the QA/QC requirements to the field staff and subcontractors prior to the initiation of work. The FOL also provides instruction to all field personnel to ensure that field data are collected in conformance with project QA/QC requirements as specified in the approved SAP. It is the FOL's responsibility to mobilize the appropriate sampling and monitoring equipment, to ensure that field control samples are collected as required, to maintain chain of custody and to maintain the appropriate field documentation. The FOL has full authority over logistical aspects of sampling in the field and is responsible for identifying the resources necessary to meet the intended schedule.

Mr. Miller has over 10 years of experience in hazardous waste site investigations for the public and private sector as field operations leader, sampling technician for water, soil and sediment samples, the installation of groundwater monitoring wells and the development of sampling and analysis plans and standard operating procedures.

ICF KE Removal Lead, Mr. Robert Bear: (Telephone 412/788-9200)

The removal design and implementation team is not directly involved with the pre-removal site characterization other than in the completed phase of identifying alternative evaluation data needs. However, in order to provide continued project continuity from the identification of data needs through site characterization and removal implementation, the removal team lead will remain involved with the site characterization to ensure that data needs identified are met. The Removal Lead will

report directly to the project manager and will review a copy of the data as it is obtained. The Removal Lead will develop removal and waste transportation contractor bid specifications as the data is being collected and the results of the volume calculations will be added as received. It is the responsibility of the Removal Lead to evaluate the data collected from within the former disposal area to determine what percentage of the material can be segregated for land disposal versus thermal treatment. The Removal Lead is responsible for the solicitation of bids during the agency review process with award to be made upon approval of the final removal work plan.

Mr. Bear, who currently serves as a project manager with ICF KE, has managed the design and implementation of turnkey closures of RCRA and CERCLA solid waste management units, developed corrective action assessments and remediation plans for exposed hazardous waste sites and managed the closure and remediation of contaminated soil and groundwater associated with underground storage tank removals.

Project Health and Safety Staff:

The project health and safety staff includes the H&S Program Director and the site safety officer. The responsibilities and reporting requirements and qualifications of these project personnel are specified in the Health and Safety Plan found as Section 5 of the Site Operations Plan.

Project Hydrogeologist, Mr. Mark Hurban, P.G.:

The Project Geologist has the responsibility for supervising the drilling subcontractor during the installation of the three proposed groundwater monitoring wells, classifying lithology samples and determining well depths and screen lengths in the field. It is the project geologists responsibility to ensure that field engineering and geological data is in accordance with currently accepted professional standards and that wells are installed in accordance with the approved SAP.

Mr. Hurban has been involved as a geologist/hydrogeologist for ICF KE for more than six years. He has served as site geologist, field operations leader and assistant site manager directing and supervising field personnel and subcontractors, drilling and monitoring well installations, soil and groundwater sampling, aquifer testing and petroleum hydrocarbon groundwater cleanup projects. Mr. Hurban is experienced evaluating geologic data and preparing concise geologic summaries.

Project Risk Assessment Lead, Dr. Bruce Fishman:

The Project Risk Assessment Lead has the responsibility of ensuring that data needs identified during the project scoping phase are met, that risk assessment required detection limits are reached, that all source/receptor pathways are characterized and that the post-removal public health and environmental risks are properly evaluated and reported.

Dr. Fishman has a Ph.D. in pharmacology and toxicology and has participated in the direction, preparation or review of more that 50 quantitative public health and environmental risk assessments. His technical focus is on site-specific, multipathway, multimedia risk assessments for hazardous waste site investigations. He is experienced with and has performed extensive research in the quantitative evaluation of risk associated with DDT, arsenic, dieldrin and other pesticides in agricultural soils in California.

ICF KE Field Sampling Technicians:

Sampling technicians are responsible for implementing sampling procedures as described in the approved SAP. It is their responsibility to know and understand the sampling procedures prior to initiating them and to perform the work within the guides of the H&S Plan. Sampling technicians do not have the authority to revise the approved SAP field methods. Field technicians assigned to the Walton's Farm Site characterization will have at least six months of prior field sampling experience.

2.2 SUBCONTRACTORS

As with the prime contractor, PPG Industries, Inc. reserves the right to substitute, with prior USEPA approval, subcontractors with equivalent or improved quality subcontractors. At this time, subcontractors have been identified to provide the laboratory services and the survey and mapping. A New Jersey experienced and licensed drilling subcontractor will be identified in the future. It is anticipated that a competitive bid process will be used to identify the actual subcontractors. The solicitation process will take place during the planning process.

2.2.1 Laboratory Subcontractor - Analytikem

AnalytiKEM of Cherry Hill, New Jersey, has preliminarily been selected to provide the laboratory support to the Walton's Farm Site Pre-Removal Site Characterization. The laboratory was selected primarily based on location and quality. The laboratory organization supporting the selected laboratory is illustrated in Section 3 of the Site Operations Plan. The responsibilities and qualifications of the key laboratory personnel and the laboratory QA/QC Plan are provided within the laboratory QA/QC Plan.

2.2.2 Aerial Mapping and Surveying - Aerial Data Reduction

ADR of Pennsauken, New Jersey, has been preliminarily identified as the mapping firm of choice for providing the base map and ground survey for the site. The firm was selected based on available mapping of the area, known technical quality and proximity to the site.

2.2.3 Groundwater Monitoring Well Drilling and Installation - TBD

The New Jersey licensed and experienced driller has not been identified, but will be during the planning process.

2.3 DATA VALIDATION ORGANIZATION

The data validation team organization supporting the Walton's Farm Site pre-removal site characterization is discussed below. Resumes are provided in Appendix A.

Quality Assurance Manager, Mr. Richard McCracken: (Telephone 412/788-9200)

Mr. McCracken will act as the data review supervisor. He has a B.S. in Chemistry, four years of laboratory experience and over 8 years of data validation experience for organic and inorganic data sets. He has performed data validation for the NJDEP sites of A.O. Polymer, PJP Landfill, the Rockaway Municipal Wellfield Site, and at over 30 other Superfund sites.

Data Reviewer, Mr. John Johnson

Mr. Johnson has a B.S. in chemistry and more than five years of experience in research, development and environmental analysis. His experience includes organic synthesis, instrumental analysis, data compilation and review and sampling. He is certified as an organic data validator in the USEPA Region II and is experienced validating data packages using NJDEP methods.

3.0 QUALITY ASSURANCE OBJECTIVES

The overall QA objective is to provide data that will be representative of site conditions and legally defendable in a court of law. The QA objective will be achieved through the implementation of specific procedures for sampling, chain of custody, calibration, laboratory analysis, data validation and reporting, internal quality control, audits, preventative maintenance, and corrective actions as described in this SAP. The purpose of this section is to define QA goals for precision, accuracy, representativeness, completeness and comparability (PARCC).

3.1 PRECISION

Precision refers to the level of agreement among repeated measurements of the same parameter. It is usually stated in terms of standard deviation, relative standard deviation, relative percent difference, range, or relative range. The overall precision of a piece of data is a mixture of sampling and analytical factors. The analytical precision is much easier to control and quantify because the laboratory is a controlled, and therefore measurable environment. Sampling precision is unique to each site, making it much harder to control and quantify. The goals for each factor will be addressed here separately.

Sampling precision will be checked by obtaining a duplicate sample for every 20 samples collected for each type of media. Precision will be evaluated by calculating the relative percent difference (RPD) as follows:

$$\text{RPD} = \frac{\text{difference between the two measured values}}{\text{average of the two measured values}}$$

The RPD will be calculated for each analytical parameter. It is anticipated that the water duplicates will have RPDs of $\leq$30%, and the soil and sediment duplicates $\leq$50%. If these criteria are not met, a careful examination of the sampling techniques, sample media, and analytical procedure will be conducted to identify the cause of the high RPD and the usability of the data.

Laboratory precision will be evaluated by the analysis of duplicate samples. The RPD for each analytical parameter will be calculated as a measurement of precision. For analyses conducted using the CLP organic methods, the RPD criteria as specified in the CLP Statement of Work (SOW) are hereby adopted. An RPD of $\leq$ 40% is adopted for SW-846 analyses. If these criteria are not met, a careful examination of the sampling techniques, sample media, and analytical procedure will be conducted to identify the cause of the high RPD and the usability of the data.

3.2 ACCURACY

Accuracy refers to the difference between a measured value for a parameter and the true value for the parameter. It is an indicator of the bias in the measurement system. Sources of error measured by this parameter include the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analytical technique.

The sampling accuracy will be assessed by collecting one field rinsate blank per decontamination event for each type of sampling equipment and one trip blank each day that water samples are being collected for volatile analysis. The goal for the field rinsate and trip blanks will be that they

contain less than the Contract Required Detection Limit (TCL analyses) or the method detection limit (non-TCL analyses), for each analytical parameter. If analytes are detected in the blanks above these levels, the sample data will be compared with the blank data and may be rejected or qualified, depending on the relative amounts present.

Laboratory accuracy will be evaluated using method blanks and spiked samples. For samples being analyzed using CLP methods, the spike acceptance criteria specified in the CLP SOW are adopted. The volatile and semivolatile method blanks must contain no more than the CRQL of the target compounds. The accuracy goals for the non-TCL analyses are set at 60% to 140% for the spike recoveries and less than the method detection limit for the blanks. If these criteria are not met, a careful evaluation of the data will be performed to determine the source of the error and usability of the data.

3.3 REPRESENTATIVENESS

Representativeness is a measure of the degree to which the measured results accurately reflect the medium being sampled. It is a qualitative parameter which is addressed through the proper design of the sampling program in terms of sample location, number of samples, and actual material collected as a "sample" of the whole. The rationale for the numbers and locations of each sample can be found in section 1.4 of this document.

Sampling protocols (discussed in the Section 4 of this document) have been developed to assure that samples collected are representative of the media. Field handling protocols (e.g., storage, handling in the field, and shipping) have also been designed to protect the representativeness of the collected samples. Proper field documentation will be used to establish that protocols have been followed and that sample identification and integrity have been maintained.

3.4 COMPARABILITY

Comparability expresses the confidence with which one data set can be compared to another. When comparing data, it is important to compare data collected under the same set of conditions. This means that seasonal trends, depth of sample collection, analytical protocol, stream flow during sample collection, and any other sampling/analytical variables must be taken into account when comparing data sets. Previous data collected by the EPA and PPG have been evaluated and are comparable in terms of the same sampling methods and analytical procedures set forth in this document. The sampling and analytical methods set forth in this document are well established, standard procedures which should allow for comparability with future data.

3.5 COMPLETENESS

Completeness is a measure of the amount of information that must be collected during the field investigation to allow for a successful achievement of the pre-removal site characterization objectives. A certain amount and type of data must be collected during the site characterization for conclusions to be valid. Missing data may reduce the precision of estimates or introduce bias, thus lowering the confidence level of the conclusions. While completeness has historically been presented as a percentage of the data that is considered valid, this does not take into account critical sample locations or critical analytical parameters.

The amount and type of data that may be lost due to sampling or analytical error cannot be predicted or evaluated in advance. CLP methodologies have historically been 80 to 85 percent complete on a nationwide basis (EPA 1987). The present investigation will attempt to be at least 90 percent complete. However, the importance of any lost or suspect data will be evaluated in terms of the sample location, analytical parameter, nature of the problem, decision to be made, and the consequence of an erroneous decision. Critical locations or parameters for which data are determined to be inadequate may be resampled.

4.0 FIELD OPERATIONS

The standard sampling procedures to be used for the PPG Walton's Farm Site project are described in this section. Details are provided for both field measurement activities and sample acquisition. Details are also provided for:

- Equipment cleaning and decontamination
- Drilling and monitoring well installation
- Sample storage and handling
- Documentation

In addition to the requirements described in the above protocols, the following general requirements apply to all sampling activities:

- Whenever possible, samples will be collected in order of least contaminated to most contaminated so that risks of systematic contamination are minimized.

- Wherever possible, sampling equipment will be pre-cleaned (in accordance with Section 4.5), wrapped, and dedicated to one sample location. If the amount of sampling equipment required to collect samples makes this impractical, field decontamination will be used in accordance with Section 4.5.

- Sample containers and blank water will be obtained from the analytical laboratory subcontractor who will provide new and properly cleaned sample containers. The bottles will be prepared in accordance with the USEPA CLP protocol. The laboratory subcontractor will also provide demonstrated analyte free field and trip blank water.

4.1 SAMPLING PROCEDURES

4.1.1 Surface Soil Sampling

Scope and Application

Surface soil sampling provides information on the area and depth of site contamination. This procedure is applicable for collection of surface soil from a 0 to 6 inch depth interval during the PPG Walton's Farm Site project.

Summary of Method

Surface soil samples are collected from a depth of 0-6 inches using a decontaminated, dedicated metal scoop or trowel, homogenizing the sample, and placing the soil in appropriate sample jars.

Equipment

- Decontaminated stainless-steel scoop or trowel
- Decontaminated glass or stainless-steel bowl
- Engineers rule

Procedure

1. Clear any surface debris (e.g., vegetation, rocks, twigs) at the desired sampling location.

2. Collect an adequate portion of soil from a depth of 0-6 inches using the scoop or trowel, and place it in the bowl.

3. Homogenize the sample by stirring it with a scoop or trowel.

4. Transfer the sample directly into the sample container.

5. Cap and tighten the sample container and affix a label.

6. Using the engineers rule, measure the depth of the sample taken and record it on the sample log sheet.

Precautions

- Do not handle the sample with anything but a sampling implement

- Do not collect organic matter such as roots or twigs with the soil.

4.1.2 Subsurface Soil Sampling

Scope and Application

Subsurface soil sampling will supply information on subsurface lithology and provide materials for use in evaluating the vertical and horizontal extent of contamination. Two methods of collecting subsurface samples are presented.

1. Split Spoon Sampling - Applicable for collecting undisturbed soil samples in compacted soils or at depths of 5 feet or greater.

2. Hand Auger Sampling - Applicable for collecting samples for analysis in soft soils or at depths of greater than 1-foot but less than 5 feet.

Split Spoon Sampling

Summary of Method

A split-spoon sampler is used to collect soil ahead of hollow stem drill rig augers. The soil sample is subsequently placed into sample jars for laboratory analysis.

Equipment

- Decontaminated commercial split-spoon sampler
- Drill rig and accessories
- Decontaminated metal spoons
- Decontaminated glass or metal bowl

Procedure

1. Collect a split-spoon sample during drilling using ASTM Method D1586-84, Penetration Test and Split Spoon Sampling of Soils.

2. Open the sampler and log the material.

3. Place the soil in a bowl and thoroughly mix it using a spoon.

4. Fill the sample jar with soil. Cap and tighten the sample container and a affix label.

5. Discard any remaining sample with the drill cuttings.

6. Decontaminate the split spoon and sampling equipment.

7. Record the sampling data on a sample log sheet.

Precautions

- Do not handle a sample with anything but a sampling implement.

Hand Auger Sampling

Summary of Method

Hand auger sampling will be used wherever the total depth of sampling is less than 5 feet or when drill rig access is not possible. Surficial soils must be composed of relatively soft and non-cemented formations to allow penetration by the auger.

Equipment

- Engineers rule
- Decontaminated commercial hand auger
- Decontaminated metal spoons
- Decontaminated glass or metal bowl

Procedure

Hand auger borings will be advanced in accordance with ASTM D1452-80, as follows:

1. Remove any surficial debris (e.g. vegetation, rocks, twigs)

2. Place the bucket of the hand auger on the ground and rotate in a clockwise direction until the bucket is full.

3. Remove the bucket from the ground and place the soil in a bowl. A metal spoon may be helpful in getting the material out of the auger.

4. Homogenize the sample by stirring it with a spoon, then transfer the sample directly into the sample container.

5. Cap and tighten the sample container and a affix label.

6. Using an engineers rule, measure the depth of the sample taken and record it in a field notebook and sample log sheets.

7. Repeat steps 1 through 6 for deeper samples.

Precautions

- Do not handle a sample with anything but a sampling implement.

4.1.3 Surface Water/Sediment Sampling

Scope and Application

Surface water samples provide an indication of the amount of contamination in the water, while sediment samples indicate the amount of contamination adsorbed on sediment particles and/or the amount of wastes transported from the site. Two methods of collecting sediments are presented.

1. Surface Water - Direct Collection: Applicable for collection of surface waters from streams or small impoundments where direct access to the water is possible. This method is preferred when possible.

2. Sediment - Core Tube Method: Applicable for collection of sediment in shallow water. This method will be used for the sediment samples collected down stream of the former disposal area in the tidal channel.

3. Sediment - Dredge Sample Method: Applicable for collection of sediments in deeper water.

Surface Waters - Direct Collection

Summary of Method

In shallow or boat accessible surface waters, samples will be collected by immersing the sample bottle directly into the water. The samples will be collected starting at the downstream location and moving upstream.

Equipment

- Waders for shallow waters or a boat for deeper waters
- Disposable latex gloves

Procedure

Collect the surface water directly into the sample bottles as follows:

1. Remove the cap from the sample bottle(s).

2. Hold the bottle with the opening pointed upstream. Immerse the top of the bottle several inches under the water and allow it to fill.

3. Remove the bottle from the water and cap. Add the proper preservative prior to shipping the sample to the laboratory.

Precautions

- If both surface water and sediment samples are to be collected at the same location, obtain the surface water sample first. Sediment sampling usually results in disturbance of the sediments which may influence the analytical results of the surface water sample.

- pH, conductivity, and temperature field measurements are required. These measurements are taken directly in the water body after the sample is collected.

Sediment - Core Tubes

Summary of Method

If water above the sediment sampling location is relatively shallow, the sediment sample will be collected with a polyethylene sample tube. The sample is collected by shoving the tube into the sediment, withdrawing it, and homogenizing the resultant sample.

Equipment

- Decontaminated metal scoop or trowel
- Commercial 24-inch polyethylene core tube
- Waders waters or a small boat
- Decontaminated glass or metal bowl

Procedure

1. Uncap the core tube on both ends

2. Push the polyethylene tube into the sediment as far as it will go, then cap the free end. Remove it from the sediment slowly so as to recover as much of the sediment in the tube as possible.

3. Allow the core tube to settle and then pour off the excess water.

4. Transfer the sediment into the bowl and homogenize it.

5. Fill the sample jar with sediment, cap the jar, and affix a sample label.

6. Discard the excess sediment in the location from which it was obtained.

Precautions

- Sediments must be collected starting at the downstream location and proceeding upstream.

Sediments - Ponar Dredge

Summary of Method

If the water above the sediment collection point is relatively deep, a Ponar dredge sampler will be used to collect the samples. The dredge functions like a small clam shell sampler. Once collected, the sample is homogenized prior to sample analysis.

Equipment

- Decontaminated metal scoop or trowel
- Decontaminated glass or metal bowl
- Small boat
- Polyethylene a polypropylene rope
- Decontaminated Ponar sampler

Procedure

1. Attach the decontaminated sampler to a length of rope, open the jaws, and slowly lower it to the bottom.

2. Allow the rope to go slack once the bottom is reached. Raise the dredge to activate the mechanism which will close the jaws.

3. Raise the sample, decant off the excess water, place the sediment in a bowel, and homogenize the sample.

4. Fill the sample jar with sediment, cap the jar and affix a sample label.

Precautions

- Sediments must be collected starting at the downstream location proceeding upstream.

4.1.4 Ground Water Sampling

Scope and Application

Ground water samples give an indication of the nature and extent of any groundwater contamination. This method is applicable to all monitoring wells installed during the Walton's Farm Site project. The residential well sample will be collected directly from the tap upon stabilization of pH, conductivity and temperature (See procedure no. 4 of this section).

Summary of Method

Wells will be purged to remove standing water and a representative groundwater sample will be obtained. Purging will take place with a pump, while samples will be collected with a bailer. All samples will be collected, stored and transported using established methods to maintain the integrity of the sample.

Equipment

- Decontaminated Teflon or stainless steel bailer
- 10 foot bailer leader constructed of single strand stainless steel wire
- Polyethylene or polypropylene bailer rope
- Submersible pump
- Surficial suction pump
- Electric generator
- 1 1/2 in. ASTM drinking water grade flexible polyethylene tubing
- Electrical connections associated with submersible pump
- Downrigger with stainless steel wire or other system for lowering and withdrawing the pump from the wells
- pH meter, conductivity meter, thermometer
- hose clamps

Procedure

1. Remove the well cap and check for volatile organics in the headspace using an organic vapor monitor (OVM).

2. Measure the static water level and total depth of each well using the methods described in Section 4.2.4. Record the data and determine the purge volume using Table 4-1 or the formula ($\pi r^2 h$). If more than 24 hours have gone by since water levels were collected, check the static water level prior to purging.

3. Purge three to five well volumes from the well, using a bailer, submersible pump, or surficial suction pump. Select evacuation equipment based on the criteria described below. The pumps are the preferred evacuation methods.

   a. Submersible pumps are most effective for wells larger than 4 inches in diameter that recharge quickly and where water levels are greater than 20 feet below the ground surface. The submersible pump must be decontaminated between wells by washing the outside surfaces with tap water and a non-phosphate detergent, then rinsing it with tap water.

b. The surficial suction pump can only be used if the water level in the well is not lower than 20 to 22 ft. below the ground surface. Dedicated intake tubing will be used for each well. New linear polyethylene tubing that conforms to the ASTM drinking water grade specifications will be used as the intake line. The intake line will be discarded after every use.

c. Bailers are most applicable for purging small diameter, low yield wells. If a bailer is used, it should be dedicated to the well, i.e., used for only one well. Field decontamination of bailers is not permissible.

4. Check the pH, conductivity, and temperature after each well volume to determine stabilization. Two successive readings should give values within the following ranges:

   Specific Conductance: $\pm$ 10 umhos/cm for 0-800 range($\pm$ 50 at 800-1000)
   pH: $\pm$ 0.1 pH units
   Temperature: $\pm$ 0.5°C

   Continue purging the well until the readings have stabilized or five volumes have been purged. Remove a maximum of three well volumes prior to sample collection. Record the stabilization results on the field data sheet. If the well can be bailed dry, allow it to recharge for a maximum of three hours and collect a sample.

5. Collect a water sample using a decontaminated bailer which has been wrapped in foil. Each bailer should be used to collect a sample from only one well. Sample the well within 2 hours of purging. Slow recharging wells are permitted to sit for no more than 3 hours prior to sampling.

6. Place the samples on ice. Add the proper preservative prior to shipment to the laboratory.

7. Replace the well cap and lock the cover.

8. Record all of the purging and sampling data on the field log sheet.

Precautions

- Sampling of groundwater from monitoring wells will be conducted no sooner than 14 days following the installation of the monitoring wells.

- A clean pair of gloves will be worn for each monitoring well sample collected.

- Protect all equipment from contamination by storing on plastic sheeting.

- The generator providing electrical power for pumps should be placed downwind of the well head and turned off prior to sample collection.

TABLE 4-1
VOLUME OF WATER IN CASING OR HOLE

Diameter of Bore Hole (in.)	Gallons per Foot of Depth	Cubic Feet per Foot of Depth
1	0.041	0.0055
1½	0.092	0.0123
2	0.163	0.0218
2½	0.255	0.0341
3	0.367	0.0491
3½	0.500	0.0668
4	0.653	0.0873
4½	0.826	0.1104
5	1.020	0.1364
5½	1.234	0.1650
6	1.469	0.1963
7	2.000	0.2673
8	2.611	0.3491
9	3.305	0.4418
10	4.080	0.5454
11	4.937	0.6600
12	5.875	0.7854
14	8.000	1.069
16	10.44	1.396
18	13.22	1.767
20	16.32	2.182
22	19.75	2.640
24	23.50	3.142

1 Gallon = 3.785 Liters
1 Meter = 3.281 Feet
1 Gallon Water Weighs 8.33 lbs. = 3.785 Kilograms
1 Liter Water Weighs 1 Kilogram = 2.205 lbs.
1 Gallon per Foot of Depth = 12.419 Liters per Foot of Depth
1 Gallon per Meter of Depth = 12.419×10^{-3} Cubic Meters per Meter of Depth
1 Cubic Foot = 7.48 Gallons

4.2 FIELD MEASUREMENTS

4.2.1 pH

Scope and Application

This procedure will be used for the aqueous samples collected at the PPG Walton's Farm project. pH is a measure of the hydrogen ion content of a solution, and thus gives a general indication of the acidity or alkalinity of a water sample.

Summary of Method

The pH of a solution is determined using a pH meter and combination electrode.

Equipment

- pH Meter
- Combination electrode
- Buffer solutions of pH 4, 7, and 10
- Wash bottle with DI water

Procedure

Calibration: Calibration of the pH meter will be performed on a daily basis at the start of the day as follows (calibration may differ among the different types of models used, therefore the manufacturers instructions should first be consulted):

1. Rinse the electrode with distilled water.

2. Determine the buffer temperature and set the temperature compensator to the proper reading.

3. Place the electrode in a commercial buffer solution with a pH of 4 (expected lower range) and adjust the calibration knob until the readout displays the proper pH value.

4. Remove the probe from the solution, rinse it with distilled water.

5. Place the probe in a second commercial buffer solution with a pH of 10 (expected upper range) and adjust the slope control until the meter reads the pH value of the buffer solution.

6. Remove the probe from the solution and rinse it with distilled water.

7. Place the probe in a third commercial buffer with a pH of 7 and record the meter reading.

8. If the measured value varies from the expected value by greater than 0.2 pH units, recalibrate the instrument with fresh aliquots of buffer solution. If the discrepancy persists, alert the Field Team Leader. He has the option of trying to fix the meter or obtaining a second pH meter.

Records of all calibrations must be kept in the field log book.

Operation: The pH meter should be operated using the following procedure:

1. Rinse a small beaker with sample water, discard the water, and again fill the beaker with sample.

2. Rinse the pH probe with sample water.

3. Determine the sample temperature and adjust the pH meter temperature compensator.

4. Place the probe in the sample and swirl gently, keeping the probe in the sample until the reading stabilizes.

5. Record the sample pH and temperature, and note any problems such as meter drift.

6. Rinse the pH probe with distilled water.

Maintenance: The following steps will be taken to insure proper operation of the pH meter.

1. Check the batteries each time the meter is used.

2. Keep the probe stored in a 0.1 M KCl solution adjusted to pH 4 when the meter is not in use. Alternately, the electrode may be rinsed with deionized water and the protective cap put on, trapping any residual water inside it (do not blot the electrode dry prior to putting the cap on).

Precautions

- Coatings of oily material or particulate matter can impair electrode response. They can usually be removed by gentle wiping or detergent washing, following by distilled water rinsing.

- Do not store the electrode in distilled or deionized water when not in use as this causes the reference junction to become plugged with silver chloride (AgCl).

4.2.2 Temperature

Scope and Application

This procedure will be used to determine the temperature of aqueous samples. Two methods may be employed, one which involves a thermometer and one which involves direct reading from a specific conductivity meter (described in Section 4.2.3). This section will address the measurement of temperature with a portable mercury thermometer.

Summary of Method

A thermometer is inserted in the sample media to measure the sample temperature.

Equipment

Portable mercury thermometer with protective case.

Procedure

1. Rinse the thermometer with distilled water.

2. Insert the thermometer into the sample, and leave it in the sample until the temperature stabilizes.

3. Record the temperature reading, being sure to indicate ^{o}C or ^{o}F.

4. Rinse the thermometer with distilled water.

NOTE: $^{o}C = (^{o}F - 32) \times 5/9$
$^{o}F = 9/5^{o}C + 32$

Precautions

- Transport the thermometer in its case.

- If you break a thermometer, return it to the office for proper disposal since mercury is a hazardous substance.

4.2.3 Specific Conductivity

Scope and Application

This procedure is applicable to all aqueous solutions collected during the PPG Walton's Farm project. Conductivity is the ability of an aqueous solution to pass an electrical current. The current is primarily carried by dissolved anions such as chlorides, nitrates, and sulfates, along with cations such as sodium, calcium, and magnesium. Organic compounds do not carry current and therefore have almost no conductivity.

Summary of Method

The conductivity probe is inserted into the sample and the specific conductance is read from the meter after adjusting to the appropriate scale. The meter is calibrated at the beginning of each sampling trip.

Equipment

- Conductivity meter
- Conductivity cell
- 0.0100 normal KCl solution
- Wash bottle with deionized water

Procedure

Calibration: The specific conductivity meter should be calibrated at the beginning of each sampling trip, as follows (Calibration may differ among the different types of models used, therefore the manufactures instructions should first be consulted):

1. Thoroughly rinse the probe with 0.01 N KCl solution.

2. Measure the specific conductance of fresh 0.01 N KCl solution, and record it in the field notebook. The specific conductance should read 1413 umho/cm. If any deviation of 0.01 is noted, adjust the calibration knob until the appropriate reading is obtained for the standard solution.

3. Determine the temperature of the KCl solution, and record it in the field notebook.

Records of all calibrations will be kept on file.

Operation: The specific conductivity meter will be operated as follows:

1. Thoroughly rinse the probe and sample beaker with sample water.

2. Measure the temperature of the sample water. Convert Fahrenheit temperature readings to Celsius using $^{o}C = 5/9 (^{o}F - 32)$ if Celsius temperature is not obtained directly.

3. Fill the beaker with sample. Completely submerge the probe in the sample. Swirl the probe to remove any trapped air bubbles.

4. Select the highest multiplier scale on the meter and turn the instrument on. Progressively use lower multiplier scales until a mid-scale deflection is obtained.

5. Record the temperature and conductivity values.

6. Specific conductivity values are corrected for temperature using:

$$K(25°C) = \frac{K \text{ measured}}{1 + 0.0191\ (t-25)}$$

where:

K = conductivity in umhos/cm
t = temperature, °C

Maintenance: The following steps will be taken to insure proper operation of the conductivity meter:

1. Check the batteries each time the instrument is used.

2. When not used for more than 24 hours soak the probe in distilled water for several hours prior to use.

3. Inspect the probe on a daily basis for damage or loss of platinum black plating from the electrode. If the platinum is damaged, alert the Field Team Leader and arrange to get a new cell.

Precautions

Be certain there is no air in the cell before taking a reading.

4.2.4 Water Levels

Scope and Application

This method is applicable to the measurement of water levels in the monitoring wells installed during the Walton's Farm Site project. The measurement of static water levels in monitoring wells will enable the direction of groundwater flow as well as an estimation of the flow velocity to be determined. The staff gauges in the on-site pond and tidal channel should be read directly at the time of groundwater monitoring well measurements.

Summary of Method

The distance to the static water level is measured from the top of the inner well casing (or protective casing if the well has no inner casing) using a tape attached to a "popper".

Equipment

- Steel surveyors tape
- Folding engineers rule
- Hollow bottom weight or "popper"

Procedure

1. Measurements must be taken in all of the wells prior to performing any purging or sampling operations.

2. Open the well and scan the head space with an OVM.

3. Select the appropriate reference point on the well. The reference point is a point of known elevation as determined by a licensed surveyor. It is usually indicated by a notch or indelible mark. If no reference mark is visible, the reference point is the highest point on the inner casing or the highest point on the outer protective casing if there is no inner casing.

4. Lower the tape and popper into the well and listen for the sound of the popper hitting the water.

5. Pull the tape out a few inches and with fingers resting on the reference point, drop it in 1/2 in increments until the sound is heard again.

6. Use smaller increments and repeat the withdrawal/lowering procedure until the water level is determined to within 0.02 ft ($\pm$ 0.01 ft.)

7. Hold the depth mark on the tape securely and withdraw the tape from the well. If the tape used is not marked in 0.01 ft increments, use the engineers rule to determine the depth by measuring to the nearest graduation on the tape.

8. Determine the length of the popper ahead of the tape and add to the depth.

9. Record time, date, and all measurements in the log book.

10. Decontaminate the tape and popper.

Precautions

- In some wells it may not be possible to hear the popper as it contacts the water. An electronic water level indicator should be on hand as back-up for these wells. If the electronic device is used it should be checked against the steel tape in a well where the steel tape worked. The procedure for using an electronic water level indicator is the same as described above except in for items 4, 5, and 6, a visual or audible signal will indicate when the water level is encountered.

4.2.5 Surveying

Scope and Application

Surveying shall include the horizontal and vertical location of all test borings, monitoring wells, sampling points, surface water staff gauges and any other pertinent features relative to the Geodetic vertical data of 1929 and the state of New Jersey horizontal co-ordinate system. All surveying will be performed by a New Jersey State Licensed Surveyor.

Summary of Method

Surveying Specifications may be found in Appendix B.

Equipment

The equipment used for surveying will be provided by the subcontracted surveyor.

Procedure

Surveying shall be performed by the subcontracted surveyor.

Precautions

Surveyors shall be required to comply with OSHA 1910.120.

4.3 WELL DRILLING AND INSTALLATION

Scope and Application

The drilling methods presented in this section are applicable during field work at the PPG Walton's Farm Site project. Well drilling and installation will provide information on underground lithology and access to groundwater sampling.

Well Locations

Well locations for the PPG Walton's Farm Site project are presented in Section 1.4.4.

Monitoring Well Installation/Soil Boring Requirements

Monitoring wells will be installed in accordance with the NJDEP monitor well specifications in Appendix D. During soil boring and monitoring well installation activities, the project geologist will oversee site activities and make final decisions on drilling and well screening depths. Prior to drilling monitoring wells or soil borings, drilling permits will be obtained pursuant to N.J.S.A. 58:4A-14. All wells and borings will be drilled under the direct supervision of a New Jersey licensed well driller.

Drilling Methods:

Hollow-stem auger drilling methods capable of installing minimum 8-inch outside diameter boreholes will be employed to drill shallow wells and the soil borings. Wells that encounter a confining layer will require the installation of minimum 10-inch diameter surface casing to the depth of the confining layer. The surface casing will be securely grouted in place if drilling is needed below the level of the confining layer.

Soil Sampling:

Standard penetration testing (ASTM 1586-84) will be performed continuously using decontaminated, 2-foot, split-spoon samplers to a final depth specified by the site geologist. No Rock Coring is anticipated for the Walton's Farm Site project. If not required for laboratory analysis, representative samples from the split-spoon samplers will be placed in labeled, watertight jars for later reference. A geologist will log all samples immediately upon collection using visual descriptions. Field notes will include as a minimum:

- Date
- Geologist
- Weather conditions
- Drilling method and hole diameter
- Organic vapor measurements
- Groundwater conditions (including groundwater levels)

Soil material descriptions will include:

- Depth interval
- Standard penetration test blow counts
- Split-spoon recovery
- Color(s)

- Description of grain size distribution
- Description of the coarse grains (if present)
- Consistency (for intact fine-grained samples)
- Moisture content
- Soil type (residual, alluvial, fill, etc.)

Well Materials

1. Protective Casing: 6 in diameter, steel set 2 to 3 ft below ground level and secured with cement collar. The casing will be fitted with a locking cap.

2. Riser: 4 in I.D., Schedule 40, PVC, with threaded, flush joints.

3. Screen: 4 in. I.D., #10 slot, PVC, approximately 5 to 10-ft length, depending upon field conditions.

4. Filter Pack: Washed, granular, siliceous material will be used for the filter pack. The grain size will be approved by the site geologist based on the formation characteristics.

   Filter Pack Installation: Gravity fill to a level chosen by the project geologist on the basis of the well logs, at least 2 ft above top of screen, installed to prevent bridging.

5. Bentonite Seal: Bentonite pellets dropped over the filter pack to form a seal at least 2 feet thick. Allow pellets to hydrate for one hour before grouting.

   Grouting: Refer to Appendix D for cement-bentonite water proportions.

6. Surface Casing: A 10-inch diameter protective casing will be installed if drilling is required below a confining layer.

Steps in Monitoring Well Completion:

1. Assemble the appropriate decontaminated lengths of riser and screen. Make sure these are clean and free of grease, soil, and residue. The length of screen will be determined by the site hydrogeologist.

2. Lower each section of pipe and screen into the borehole, one at a time, screwing each section securely into the section below it. No grease, lubricant, or glue may be used in joining the pipe and screen sections. Teflon tape may be used if needed.

3. When the well is set to the bottom of the hole, temporarily place a cap on top of the pipe to keep the well interior clean.

4. Withdraw the augers to the level of the bentonite-seal, using the auger flights to measure distance. If natural collapse does not occur as indicated by trying to move the well pipe, place the appropriate filter pack material by gradually filling the annular space between the well pipe and augers. Monitor the rise of material in the annulus with a weighted tape to assure that bridging is not occurring. The length of the pack will be chosen by the project hydrogeologist on a case-by-case basis, and must extend between 2 feet and 3 feet above the top of the screen.

5. After the pack is in place, wait an additional 3 to 5 minutes for the material to settle.

6. Install the bentonite seal by dropping bentonite pellets into the hole gradually, again monitoring for bridging with a weighted tape.

7. Wait one hour for the pellets to hydrate. If the pellets are above the water level in the hole, add several buckets of potable water to the boring. Measure to assure the seal is at least 2 feet thick.

8. Mix the approximate quantity of cement-bentonite grout needed using the proportions of cement, bentonite and water specified in Appendix C. Be sure the grout is thoroughly mixed.

9. Lower a tremie pipe into the annulus to just above the level of the bentonite seal.

10. Pump the grout into the annulus while withdrawing the tremie pipe and the temporary casing or augers. Place grout to within 2 to 3 feet of the surface.

11. Cut the riser off approximately 2.5 feet above grade. Place a mark or notch on top of the riser as a reference point for water level measurement. Place a vented cap on the well.

12. Allow the grout to set up prior to finishing the well.

13. Fill the remainder of the annulus with neat cement. Set the protective casing around the well. Form a concrete pad around the protective casing. Lock the cap.

Well Development

Each well will be developed no sooner than 12 hours after completion. Monitoring wells will generally be developed by bailing and surging. Measurements of pH, temperature and conductivity will be made after each well volume is removed. The measurements will be made from a single bailer full of water, not a composite sample. The well volume will be calculated based on the inside diameter of the well casing and the static water level in the well (see Table 4-1 in Section 4.1.6). For wells screened in fines and for wells with poor recharge, the criteria for adequate well development will be stable readings of pH, conductivity and temperature, with visual clarity a secondary criteria.

For wells screened in coarse-grained units with rapid recharge, pH, conductivity and temperature will be measured after each well volume, until the measurements have stabilized. However, development will continue until visual clarity also has stabilized.

Well development water will be collected for a volatile organics scan with an HNu and either retained, if volatile organics are detected, for offsite disposal or discharged to the ground and allowed to infiltrate if no volatile organics are present. The discharge will be directed so that it will not migrate off-site or enter the Rancocas Creek directly. The pumping rate for development will not be reduced in order to eliminate off-site migration. In the event that the development pumping rate exceeds soil infiltration capacity, development water will be contained and allowed to infiltrate on the site.

Decontamination

A. Sampling Equipment: Sampling equipment, including split-spoon samplers, will be decontaminated using the procedures described in Section 4.5.

B. Drill Rig and Construction Materials: Decontamination of drilling equipment and well pipe and screen will take place at a central decontamination station located onsite. This will either be done in a temporary unit provided by the driller or if time is available, the removal action decontamination pad will be constructed and used during site characterization. The drill rigs, rods, augers, bits, and temporary casing, will be steam cleaned upon arriving on site. Well materials will be steam cleaned prior to installation. Rods, augers, bits, and temporary casing will be steam cleaned after each boring is completed, and prior to traveling to the next drill site. The drill rig and all tools will be decontaminated before leaving the site.

Water used for steam cleaning shall be of potable quality source. No additives will be used. The ground at the decontamination station will be covered with polyethylene sheeting to prevent splashing of soil. Steam cleaning water will be collected for volatile organics screening with an HNu and either retained for offsite disposal, if volatile organics exist or left to percolate to the ground, if no volatile organic are detected.

4.4 WASTE MATERIAL HANDLING

Investigation derived wastes will be handled in accordance with the following procedure which follows established NJDEP DHSM policy.

There are potentially five types of wastes that will be generated during the pre-removal site characterization at the PPG Walton's Farm Site project. They are:

- General garbage
- Contaminated clothing, filters, etc.
- Drill cuttings
- Groundwater
- Decon water

PPG will provide EPA with all documentation related to the disposal of any waste material generated on-site, including but not limited to manifests, certificates of destruction, and LDR forms for hazardous materials and bills of lading for non-hazardous materials.

General Garbage

General garbage may include such items as packaging material, unused sample jars, gravel pack bags, cement bags, pallets, wood and any other non-contaminated garbage. All such material will be disposed locally with a trash hauler.

Contaminated Clothing, Filters, etc.

Contaminated materials that will be generated may include such items as tyveks, used sample jars, used preservative equipment, used filters, etc. This waste will be placed in a heavy duty plastic bag staged in a secured, designated area. The bag will be labeled with the date of generation, generator name and number, site name and number, and additional requirements of N.J.A.C. 7:26-8.3 et seq. The waste will be disposed within 90 days of generation.

Drill Cuttings

All excess drill cuttings will be collected in 55-gallon drums and stored in the drum staging area for subsequent offsite disposal during the removal action.

Groundwater

Onsite well development and purge water will be collected for offsite disposal.

Decon Fluids

All decon fluids will be collected and disposed of in the same manner as the groundwater.

4.5 DECONTAMINATION PROCEDURES

Provisions will be made to collect all decontamination fluids. This will be done either through the construction and use of the permanent decontamination facility described in the removal work plan or through the use of temporary systems, depending upon the schedule of field activities. Appropriate temporary systems include drums, plastic pools, steel water tanks, etc. adapted to contain all fluids for handling per Section 4.4.

4.5.1 Heavy Equipment, Well Casing and Screen

This procedure is applicable for drilling rigs, down-hole tools, and well materials used during the PPG Walton's Farm Site project.

1. The decontamination method will employ high pressure steam cleaning.

2. Upon arrival at the site the entire drill rig will be steam cleaned including all auger flights, drilling rods and bits.

3. Upon arrival at the site all well casing and well screens will be steam cleaned inside and out. Once the pipes have been decontaminated, care will be taken to prevent contamination prior to installation.

4. Between drilling locations, only the augers, drill rods, drill rod racks, bits, temporary casing, and split spoon samplers used to collect samples that will not under go chemical analysis will be steam cleaned. The rig itself need not be steam cleaned.

5. Prior to leaving the site the rig and all tools will be steam cleaned.

4.5.2 Field Measurement Equipment

This procedure is applicable to field measurement equipment that is not to be used for collection of samples for chemical analysis. Water level measuring equipment will be cleaned using this procedure.

1. Wipe with paper towel or brush to remove grit or visible contamination.

2. Spray or scrub with mild tap water/Liquinox detergent solution

3. Rinse with tap water

4. Rinse with deionized water.

5. Decontamination procedures should be performed at the measurement location.

4.5.3 Sampling Equipment

This procedure is applicable for any equipment that will be used to collect a sample for chemical analysis with the exception of submersible pumps (see Sections 4.1.4 for this procedure). Whenever feasible, field equipment will be pre-cleaned (using this procedure) at the equipment maintenance area, wrapped in aluminum foil, and dedicated to a particular sampling point. In instances where this is not feasible, field decontamination will follow the same procedure used in the lab:

1. Non-phosphate detergent wash
2. Tap water rinse
3. 10% nitric acid rinse
4. Tap water rinse
5. Pesticide grade acetone rinse
6. Pesticide grade hexane rinse
7. Demonstrated analyte free water rinse
8. Air dry
9. Wrap in aluminum foil (if not used immediately)

Note: Steps 3 and 4 will only be performed when collecting samples for metals analysis. Steps 5 and 6 will only be performed when collecting samples for organic analysis.

4.6 SAMPLE STORAGE, HANDLING AND SHIPMENT

4.6.1 Sample Numbering System

Scope and Application

This procedure is applicable to all of the samples which will be collected during the PPG Walton's Farm Site project, including groundwater, soil, surface water, and sediment samples. An accurate sample numbering system is important for sample tracking and matching of results with collection site.

Summary of Method

A unique number is assigned to each sample collected according to a predetermined set of criteria.

Procedure

The sample numbering system will be used will be used to identify each sample taken and to provide a tracking procedure for retrieval of information. Sample numbers will be generated as follows:

1. The two letter site identifier, WF for Walton's farm.

2. A two letter sample type code, as follows:

Groundwater	GW
Surface Water	SW
Sediment	SD
Surface Soil	SO
Subsurface Soil	SS

3. A three digit location code. For groundwater samples this code will usually be the well number. For all other media, numbers will be assigned in sequence. Blanks, duplicates and other QC samples will be given a "900" number in sequence.

4. Examples:

   WF-SO-001 1st surface soil sample collected

   WF-GW-001 sample from MW-001

   WF-GW-901 first blank or duplicate sample for groundwater

5. All samples collected for chemical analysis will be numbered using this system. The system does not apply to boring soil samples collected by the site geologist for lithology purposes.

6. In the event that a second round of sampling is performed, the final three digit code will be given a prefix of 2 (eg, -201, -2901, etc.).

6. Sign and date two custody seals. These are an integral part of the custody process since they indicate if samples have been tampered with during shipping by visual or physical breakage.

7. Place the seals across the front and back of the shipping container such that they would be broken if the container is opened.

8. Complete the carrier-required shipping papers.

The custody record is completed using black waterproof ink. Any corrections are made by drawing a line through the error, initialing and dating the change, and entering the correct information. Erasures are not permitted.

Common carriers will usually not accept responsibility for handling Chain-of-Custody Record Forms. This necessitates packing the record in the sample container (enclosed with other documentation in a plastic zip-lock bag). As long as custody forms are sealed inside the sample container and the custody seals are intact, commercial carriers are not required to sign off on the custody form.

The laboratory representative who accepts the incoming sample shipment will sign and date the Chain-of-Custody Record, completing the sample transfer process. It is then the laboratory's responsibility to maintain custody records throughout sample preparation and analysis.

Laboratory Custody

The analytical laboratory will end the sample shipment COC and initiate its own COC for sample analysis, as described in the laboratory Quality Assurance Plan.

4.8 INSTRUMENT CALIBRATION AND PREVENTIVE MAINTENANCE

Several types of instrumentation will be used during the PPG Walton's Farm Site project, including:

- pH meter
- Conductivity meter
- Thermometer

Operating instructions for each of these will be available on site. Calibration procedures for measurement equipment are included in section 4.2.

While it is not possible to list the detailed preventive maintenance needed for each of these, the following general guidelines should be followed. Refer to the instruction manual for each piece of equipment if more details are needed:

- Be certain each instrument is working properly before going to the field. Perform a calibration to be sure it falls within the right range.

- Make sure the proper electrical power is available in the field.

- When not in use, store the pH electrode in pH 4 buffer solution, not in distilled water. Alternately, rinse the probe with distilled water, leave a drop of water on the bulb, and put the boot on the end of the probe.

- If the pH electrode becomes coated with oil or other organics, rinse it with acetone or methanol, then water.

- Know what you are doing before you operate any instrumentation. Get instruction or help if you are unsure.

- If the instrument is battery operated, have a spare battery. If it requires charging, be sure to charge it each night.

- Take extra electrical line for the submersible pump, and extension cords in general.

4.9 QUALITY CONTROL SAMPLES

The precision and accuracy of the field sampling procedures will be checked through the preparation, collection, submission and analysis of duplicate samples, split samples, trip blanks, and field blanks.

Trip blank samples will consist of a set of sample containers filled with laboratory demonstrated analyte free water obtained from the analytical laboratory. Blank water will be the same water used by the lab for the method blank. The blanks will be prepared in the lab; shipped from the laboratory with the sample bottles; and handled, transported, and analyzed in the same manner as the water samples be collected. They are shipped at 4°C, held in the field at 4°C, and are never opened. Trip blanks will be submitted during water sample collection at a frequency of one blank per day, provided that the samples are being analyzed for volatile organics.

A field blank will consist of two sets of laboratory cleaned sample containers. One set of containers will be filled at the laboratory with laboratory demonstrated analyte free water, prepared at the laboratory. At the field location, the analyte free water will be passed through decontaminated sample equipment and placed in the empty set of sample containers for analysis. (An extra set of VOA vials will be provided to replenish the amount lost during transfer.) The field blank water will be shipped from the laboratory at 4°C and held in the field at 4°C. Field blanks will be submitted at the rate of one blank per decontamination event for each type of sampling equipment.

Trip blanks for all matrices will be analyzed for the TCL volatile organics and will only be collected when samples are being analyzed for volatile organics. Field blanks will be analyzed for the same parameters as the samples collected that day.

Field duplicates will be collected at a rate of one per 20 samples. The water duplicates will not be homogenized, but will be collected directly into the sample bottles. The soil duplicate will be homogenized and split into the sample jars. Table 5-2 lists the QC samples proposed for the PPG Walton's Farm project.

A split sample is collected when EPA, NJDEP, the property owner, or other interested parties desires to obtain samples which are duplicates of those obtained by the contractor. If this becomes necessary, the procedure for obtaining duplicate samples described above should be followed.

In order to maintain the integrity of any sample "split" between two interested parties, the following procedures shall be followed:

1. PPG authorized personnel and sampling equipment will be used to obtain all sample aliquots.

2. Other interested parties must provide their own sample containers, blank samples, preservatives, sample shuttles, chain of custody forms, etc.

3. All interested parties desiring to obtain split samples during planned sampling episodes must provide PPG with a minimum of two weeks written notice. This is essential for planning purposes and to avoid confusion or delays in the field.

4. Analytical data generated by other parties which is submitted for purposes of challenging PPG results or for informational purposes only will first be subject to standard EPA Region II validation procedures prior to being evaluated and considered for inclusion in the site evaluation process.

5. Sampling procedures shall be witnessed by PPG representatives to verify consistent handling and packaging of each set of samples.

The holding times, preservation, shipment and storage of the quality control samples mentioned above shall be handled as the environmental samples mentioned in Section 4.6 of this SAP.

5.0 LABORATORY OPERATIONS

5.1 ANALYTICAL PROCEDURES

The analytical methods shown in Table 5-1 will be used for all analyses performed during the Walton's Farm Site project. The pesticide and volatile analyses to be used for site characterization purposes will employ the CLP methodologies. Metals analysis of the soil and water will be performed using SW846 graphite furnace atomic absorption methods. Waste characterization analyses will be performed using SW846 methods. The list of waste characterization parameters is preliminary, with the final list to be based on landfill and incinerator requirements.

The analyses will be performed by a laboratory that has met the requirements of the EPA Contract Laboratory Program. The lab will have an established QA Program that addresses sample handling, extraction, analysis, reporting, and corrective action procedures. The QA Plan for the lab will be made available to EPA upon request.

5.2 QUALITY CONTROL

The Quality Control checks for the analytical procedures are specified and discussed in section 3.0 of this document, and are summarized in Table 5-2.

5.3 SAMPLE CUSTODY

Field sample custody procedures were described in the Field Sampling Plan (Section 4).

The laboratory will end the sample shipment chain of custody procedure and initiate its own custody plan for sample analysis, as described in the Laboratory Quality Assurance Plan.

5.4 INSTRUMENT CALIBRATION AND FREQUENCY

Calibration procedures and frequency of calibration are specified for every analytical procedure used. Calibration methods which will be used are described in the Laboratory Standard Operating Procedures and the Laboratory Quality Assurance Plan.

Specific operating and calibration procedures for the pH meter, specific conductance meter, and thermometer are contained in Section 4.

5.5 DATA REDUCTION AND REPORTING

Data reduction, QC review, and reporting will be the responsibility of the analytical laboratory and is discussed in this section. Data assessment, including a formal data validation procedure, will be conducted by the contractor. The contractor will also conduct data reduction to facilitate the use of raw data in site evaluations. This process is discussed in Section 6.0 of this document.

Precautions

It is critical that sample numbers be recorded correctly both on the sample label and in the field notebook and on the chain of custody record.

4.6.2 Preservation and Holding Time

Scope and Application

Many analytical methodologies require the addition of a preservative and also have established holding times in order to stabilize and maintain sample integrity. Table 4-2 shows the potential analysis to be performed along with the preservation and holding time requirements.

Summary of Method

A predetermined amount of preservative is added to the sample based on the analysis to be performed. The holding time starts at the validated time of sample receipt for CLP analysis and at the sample collection time for all other analysis.

Equipment

- Graduated pipets
- Pipet bulbs
- Litmus paper
- Preservatives in appropriate containers with their contents and concentration clearly marked
- 250 ml glass beaker

Procedure

1. Designate a level surface for conducting preservation activities. Place a clean sheet of plastic or aluminum foil over the area.

2. Add the proper preservative to the sample bottle and shake the bottle. For samples requiring acidic preservation to a pH less than 2, add approximately 2 ml of preservative per liter of sample. Shake the sample bottle to mix the preservative. Place a small portion of the preserved sample in a clean beaker and measure the pH with litmus paper to determine that the desired pH level has been achieved.

Precautions

- Properly dispose of liquids checked for pH.

Table 4-2
Sample Preservation and Holding Times
PPG Walton's Farm Project

Matrix	Analysis	Container	Preservative	Holding Time	Analytical Method
Soil	TCL Pesticides	8 oz G	Cool 4 deg C	10 days ext 40 days anal	CLP SOW
	Arsenic Thallium	4 oz G	Cool 4 deg C	180 days	SW846, 7000
Water	TCL Pesticides	80 oz G	Cool 4 deg C	5 days ext 40 days anal	CLP SOW
	TCL Volatiles	2 x 45 ml	Cool 4 deg C	10 days	CLP SOW
	Arsenic Thallium	1 L PE	HNO3, pH < 2	180 days	
Waste	HOCs				
	Volatiles	4 oz G	Cool 4 deg C	14 days	SW846, 8240
	Herbicides	8 oz G	Cool 4 deg C	14 days ext 40 days anal	SW846, 8150
	A/B/N	8 oz G	Cool 4 deg C	14 days ext 40 days anal	SW846, 8270
	Pesticides PCBs	8 oz G	Cool 4 deg C	14 days ext 40 days anal	SW846, 8080
	Dioxins Furans	8 oz G	Cool 4 deg C	14 days ext 40 days anal	SW846, 8280
	pH	4 oz G	none	ASAP	SW846, 9045
	RCRA Metals	4 oz G	Cool 4 deg C	Hg - 28 days Other-180 days	SW846, 6000 & 7000
	Reactivity	4 oz G	Cool 4 deg C	7 days	SW846,Ch 8
	Ignitability	4 oz G	Cool 4 deg C	7 days	SW846, 1010
	TCLP	8 oz G	Cool 4 deg C	7 days	SW846, 1311
	Metals Thallium	N/A	N/A	Hg - 28 days Other-180 days	SW846, 6000 & 7000
	Volatiles	N/A	N/A	14 days	SW846, 8240
	A/B/N	N/A	N/A	7 days ext 40 days anal	SW846, 8270
	Pesticides	N/A	N/A	7 days ext 40 days anal	SW846, 8080

G = Glass PE = Polyethylene

4.6.3 Storage and Handling

The field and trip blank bottles and water will be prepared at the laboratory no more than one calendar day prior to shipment. The shipment will be made on ice and under chain of custody to the field sampling team. Upon receipt, the field sampling team will sign the chain of custody and check to see that the ice has not melted. The ice will be replenished if necessary. The blanks will be kept on ice in a secure area of the field office until used.

The clock for sample holding time begins upon sample collection. Samples will be stored at 4°C prior to analysis. Sample holding times for the proposed analyses are provided in Table 4-2. Following analyses the laboratory will store the samples at room temperature in a secure area for sixty days. PPG will be notified prior to sample disposal.

Once a sample has been collected, the sample will be preserved if appropriate and secured in a locked vehicle, a locked trailer, a custody sealed cooler, or the possession of the person assuming sample custody until shipment to the laboratory.

Soil samples not requiring chemical analysis will be retained for future reference on site in a secure area or at the soils laboratory.

4.6.4 Shipping

This procedure is applicable to packing and shipping the environmental samples that will be collected during the PPG Walton's Farm Site project. Proper packing/shipping is critical to the sample chain of custody, as well as protection of the shipper and carrier. It may be possible to have the laboratory pick-up the samples at the site. This will be determined upon project award and a note will be added to the final plan.

1. Prepare cooler(s) for shipment.

   - Tape drain(s) shut.
   - Affix "This Side Up" labels on each of the coolers.
   - Place mailing label with laboratory address on top of cooler(s).
   - Assign chain-of-custody records and corresponding custody seals to respective coolers.

2. Prepare the sample bottles.

   - Add preservatives as required
   - Check to see that lids are on tight and that bottle labels are firmly affixed
   - Spray the bottles with tap water and wipe with a paper towel

3. Arrange the sample containers in front of their assigned coolers.

4. Seal each sample container in a separate zip-loc plastic bag and arrange the sample containers in the coolers.

5. Place ice directly on and around the sample containers.

6. Fill the remaining space with vermiculite.

7. Sign the chain-of-custody (COC) form (or obtain the signature) and indicate the time and date it will be relinquished to the overnight carrier.

8. Seal the proper COC copy in a zip-loc bag and tape it to the inside lid of the cooler.

9. Close the lid and latch the cooler.

10. Carefully peel the custody seals from their backings and place them intact over the front and back edges of the cooler. Cover the seals with clear protection tape.

11. Tape the cooler shut on both ends, making several complete revolutions with strapping tape (do not cover the custody seals).

12. Ship the sample coolers to the laboratory via overnight carrier.

13. Telephone the lab and provide the following information:

- Your name
- Project name
- Number of samples sent to the laboratory for analysis
- Airbill numbers
- Place the call the business day following shipment.

4.7 DOCUMENTATION AND SAMPLE CUSTODY

4.7.1 Field Documentation

To insure a complete, useful, and reconstructible record of field activities, the documentation procedures described in this section will be followed.

Sampling and site monitoring activities (including site inspections, OVM, and HNu surveys) will be documented as follows:

- The field team leader or his designee will have in his possession a master site notebook. The master site notebook will be a hardbound notebook with consecutively numbered pages that is unique to the site. Only one master site notebook will be in use at the site at one time. Consecutive notebooks will be used as books are filled.

- Entries in the notebook will be made with black ink. Errors will be crossed out with a single line, initialed, and dated by the person making the entry.

- The site notebook will be used to record all information particular to each day's activities, including, at a minimum:

    - Persons on site and responsibility
    - Health and safety data
    - Weather conditions (recorded twice daily)
    - Equipment calibration information
    - Summary of day's sampling activities (collection and handling)
    - Sample log sheet numbers
    - Sample shipping information
    - Field observations
    - Photo documentation log

- Each entry will be initialed and dated by the person designated to keep the master notebook.

- Sampling crews will record all specific sampling information (i.e., sample number, date, time, pH, conductivity, etc.) on sample log sheets (see Figures Appendix E). Sample log sheets will be numbered consecutively to follow the sampling sequence. Use of sample log sheets will be noted in the master site notebook.

- Sample log sheets completed in the field may not be transcribed to clean sheets.

- All sample log sheets will be assembled in a loose leaf binder.

- The make, model, and serial number (if applicable) of sample collection equipment, field analytical equipment, and physical measuring equipment will be recorded in the master site notebook.

- Separate data sheets for other field activities, such as geophysical surveys, etc., may be used as needed upon approval by the Site Manager. Use of such data sheets will be noted in the master site notebook.

- The master site notebook and binder containing data sheets will become part of the permanent project file. No other field documentation (i.e., personal logbooks) will be permitted, except as noted below.

- The site hydrogeologist will maintain his/her own logbook to document observations and notes specific to monitoring well drilling and installation. Use of geologist's notebook does not excuse geologist from completing sampling log sheets for any samples collected during drilling.

- Well log sheets for recording lithology, SPT data, or well construction will also be used as provided in Appendix E.

4.7.2 Sample Custody

During collection, identification, preservation, and packing, sample custody will be maintained by field personnel. The sample will come under the custody of the analytical laboratory once it arrives there.

Field Custody Procedures

1. Sample bottles will be shipped from the laboratory to the site via commercial shuttle service or overnight mail. The bottles will be received by the field personnel and stored in a designated secure area until they are needed.

2. Upon bottle shipment receipt, the blanks will be kept at 4°C while on site. Note: Do not open the blank water containers.

3. Samples will be collected as described previously in this SAP. Sample location and sample number will be recorded on the sample log sheet and Chain-of-Custody Record. The sampler is responsible for the care and custody of the samples until they are properly transferred or dispatched.

4. When photographs are taken of the sampling as part of the documentation procedure, the name of the photographer, date, time, site location, and site description are entered sequentially in the site logbook as photographs are taken. Once developed, the photographic prints are serially numbered, corresponding to the logbook descriptions.

5. Sample labels will be completed for each sample using waterproof ink, unless prohibited by weather conditions, in which case a logbook notation should explain that a pencil was used to fill out the sample label because a ballpoint pen would not function under field conditions.

Transfer of Custody and Shipment

Samples are accompanied by a Chain-of-Custody Record Form (see Appendix E). When transferring samples, the individuals relinquishing and receiving will sign, date and note the time on the Record. This Record documents sample custody transfer from the sampler, often through another person, to the laboratory. The Chain-of-Custody Record is filled out as follows:

1. Enter header information (project number and name). For each station number, enter date, time, composite/grab, station location, number of containers, analytical parameters, and sample identification number (in remarks column).

2. Sign, date and enter the time under "Relinquished by" entry.

3. Make sure that the person receiving the sample signs the "Received by" entry, or enter the name of the carrier (e.g., UPS, Federal Express) under "Received by." Receiving laboratory will sign "Received for Laboratory by" on the lower line and enter the date and time.

4. Enter the bill-of-lading or Federal Express airbill number under "Remarks," if appropriate.

5. Place the original (top, signed copy) of the Chain-of-Custody Record Form in the appropriate sample shipping package. Retain a copy with field records.

TABLE 5-1

ANALYTICAL METHODS
PPG WALTON'S FARM PROJECT

MATRIX	PARAMETER	METHOD
Soil	TCL Pesticides	CLP SOW
	Arsenic	SW846, 7060
	Thallium	SW846, 7841
	TAL Metals	CLP SOW
	TCL Organics (volatiles, semivolatiles, pesticides/ PCBs)	CLP SOW
Water	TCL Pesticides	CLP SOW
	TCL Volatiles	CLP SOW
	Arsenic	SW846, 7060
	Thallium	SW846, 7841
Waste	Halogenated Organics	40 CFR 268
	Volatiles	SW846, 8240
	Herbicides	SW846, 8150
	Semivolatiles	SW846, 8270
	Pesticides	SW846, 8080
	PCBs	SW846, 8080
	Dioxins & Furans	SW846, 8280
	pH	SW846, 9045
	RCRA Metals (total)	
	Arsenic	SW846, 7060
	Barium	SW846, 6010
	Cadmium	SW846, 6010
	Chromium	SW846, 6010
	Lead	SW846, 7421
	Mercury	SW846, 7471
	Selenium	SW846, 7740
	Silver	SW846, 6010
	Reactivity	SW846, Chap 8.3
	Ignitability	SW846, 1010
	TCLP	SW846, 1311
	Metals	SW846, 6000 & 7000
	Thallium	SW846, 7841
	Volatiles	SW846, 8240
	Semivolatiles	SW846, 8270
	Pesticides	SW846, 8080

TABLE 5-2

QUALITY CONTROL SAMPLE SUMMARY
PPG WALTON'S FARM

Matrix	Analyses	QA Samples	Samp Frequency	Criteria
Soil	Pesticides	Field Blank	1/decon event	< CRQL
	Metals	Field Duplicate	1/20	RPD $\leq$ 50%
	Organics	Trip Blank	1/VOA Shipment	< CRQL
Water	Volatiles	Field Blank	1/decon event	< CRQL
		Trip Blank	1/shipment	< CRQL
		Field Duplicate	1/20	RPD $\leq$ 30%
	Pesticides	Field Blank	1/decon event	< CRQL
	Metals	Field Duplicate	1/20	RPD $\leq$ 30%
Waste Characterization		None Required		

5.5.1 Data Reduction

Data reduction includes all automated and manual processes for reducing or organizing raw data generated by the laboratory. For all published and referenced methods, the laboratory adheres strictly to the requirements of the method for calculation of results. Further details are supplied in the laboratory SOP.

5.5.2 Data QC Review

The preliminary data output is reviewed by the department manager as well as the QC section to determine that there are no transcription errors and that all QC acceptance criteria and method specific QC requirements are met. QC acceptance criteria (control limits) are specified for TCL analyses in the CLP SOW. The report is then prepared and given a final QC check prior to submission to the client. As a result of this review process, sample data is either accepted and forwarded to the client or corrective actions are taken, including re-extraction and re-analysis of samples. A reviewer at any level can initiate corrective action.

5.5.3 Data Reporting

CLP data reports will be prepared using the standard CLP format. Non-TCL analytical reports will include all of the raw data and the QC information outlined in Section 5.3 of this SAP. All of the data will be bound and paginated.

6.0 DATA VALIDATION

Once the data package is received from the laboratory, the analytical results and pertinent QA/QC data will be compiled onto standardized data spread sheets. The spread sheets will serve as basic reference sheets for data validation, as well as for project data use.

Prior to releasing data for use by project staff, each data package will undergo a formal validation procedure to examine laboratory compliance with QA requirements and other factors which determine the quality of the data. The validation will be performed by the contractor validation staff.

6.1 CLP DATA

The organic and inorganic validation will be performed in accordance with the EPA Region II Standard Operating Procedures. At a minimum, the following factors will be examined:

- Sample holding times
- Sample chain-of-custody
- GC/MS tuning criteria
- Initial and continuing calibration
- Laboratory blanks
- Detection limits
- Surrogate spike recoveries
- Matrix spike/duplicate analysis
- Field duplicate analysis
- Field blank contamination
- Trip blank contamination
- Internal standard area
- Pesticide instrument performance
- Compound identification criteria
- CRDL Standards
- ICP interference check
- Spike recovery
- Lab duplicates
- Laboratory control sample
- ICP serial dilution
- GFAA QC data

The data will be validated by batch. A batch will consist of a group of environmental samples as received from the laboratory and the associated field and method blanks.

Once the validation for a batch of samples is completed, a validation report will be prepared. The report will highlight major deficiencies or QA problems, and include a summary of the rejected data.

6.2 NON-CLP DATA

There is no formal data validation procedure established for the non-CLP data. A review of the

non-CLP data will be undertaken by the contractor based on the analytical method and the data deliverables. Parameters to be evaluated include:

- Holding time: Sample holding times will be compared with those established by EPA. Analyses performed beyond the holding time will be estimated and may be rejected.

- Blank results: The method and field blanks will be checked to determine analyte concentration. If the blank results are above the detection limit, sample results $\leq$ three times the method blank result will be rejected and all others will be estimated.

- Instrument calibration: The data will be checked to see that the instrument was properly calibrated prior to sample analysis and that the calibration was checked periodically during the analysis. Improper or lack of initial calibration will be grounds for data rejection. It is expected that continuing calibrations will have RPDs $\leq$ 25%. If this criteria is not met, the data will be estimated and a careful evaluation of the data will be performed to determine usability.

- Duplicate analysis: RPDs will be calculated for all of the field and laboratory duplicates. It is expected that soil samples will have RPDs < 50% and water samples < 35%. If these criteria are not, the data will be estimated and a careful evaluation of the data will be performed to determine usability.

- Spike analysis: Spike recoveries will be calculated as follows:

$$\text{Recovery} = \frac{\text{Spike result - Sample result}}{\text{Spike added}}$$

  It is expected that the recoveries will be in the range of 50% - 150%, although they can be highly matrix dependent. If the recoveries are not in the specified range, the data will be estimated and a careful evaluation of the data will be performed to determine usability.

- Detection limits: The reported detection limits will be evaluated to determine if they meet the requirements set forth in this FS-QAPP and the site work plan.

  Calculations: A portion of the calculations will be checked to verify that the lab performed them properly. If improperly performed calculations are identified, a larger portion of the data will be checked for errors. Corrected values will be reported to the data users.

  Raw Data: The raw analytical data will be checked for problems such as elevated baselines, proper analytical sequence, consistent dates, etc. Problems identified will be reported and a careful evaluation of the data will be performed to determine usability.

6.3 DATA ASSESSMENT

Following data validation, the project technical staff will assess the data and use it to begin site characterization. Data assessment activities will examine site-specific factors which interfere with chemical analyses or utility of the results. Some of the factors which will be assessed include:

- Adverse matrix effects on the analytical recoveries.

- Nature and cause of extraneous contamination not attributable to laboratory contamination.

- Reproducibility of results for site-specific media in relation to stated precision goals.

- Adequacy of the data base in terms of numbers of samples, critical data points, and representativeness for meeting stated objectives.

Validated data and related assessments will be reported in appropriate charts and tables in the pre-removal site characterization report.

7.0 PERFORMANCE AND SYSTEM AUDITS

7.1 FIELD PROCEDURES

At least once during field activities, the project quality assurance manager or his designee will visit the site to observe the sample collection, handling, and chain of custody/documentation procedures employed by site personnel. The field audit will be performed to verify the following conditions:

a. Field activities are in conformance with documents governing project operations;

b. Actual practice agrees with written instructions;

c. Appropriate field logbooks have been established; and

d. Deficiencies have been addressed and an appropriate corrective action initiated.

The QA manager will have full authority to stop site operations if procedures are not in conformance with the QA objectives set forth in this SAP. A report documenting the audit findings and recommendations will be sent to the site PM for inclusion in the permanent project file.

7.2 LABORATORY

The analytical laboratory will be audited at least 30 days prior to the analysis of the first sample. Samples will not be analyzed until all major deficiencies have been corrected by the laboratory.

8.0 CORRECTIVE ACTION

8.1 FIELD

The initial responsibility for reporting and documenting an out-of-control event lies with the field personnel. The Field Operations Leader is responsible for investigating a problem and implementing any corrective action, or for assigning other personnel to perform these tasks. The Field Operations Leader must also verify that any particular corrective action has eliminated the problem in question. The Field Operations Lead is responsible for documenting and reporting out-of-control events to the Project Manager and the QA Officer. All ICF KE field personnel have the authority to stop work when an out-of-control event has occurred that could impact the quality of the data. Corrective actions will be decided upon by the Field Operations Leader in consultation with any more experienced personnel as the Field Operations Leader deems necessary.

Corrective actions in the field are likely to be immediate in nature and can be implemented by field personnel or the Field Operations Leader; the corrective action will usually involve recalculation, reanalysis, repeating the instrument calibration or resampling a particular locations. Once an out-of-control event has occurred and the Field Operations Leader has been notified, the following steps will be taken to reestablish control: (1) the Field Operations Leader will investigate and determine the probable cause of event; (2) the Field Operations Leader will consult with senior staff if the problem warrants such consultation; (3) the Field Operations leader will decide on an appropriate corrective action; and (4) the Field Operations Leader will implement or direct others to implement the corrective action and verify its effectiveness.

Field personnel will document out-of-control events by recording the problem and its resolution in the master site notebook. Possible causes of the problem , corrective action planned, and date corrective action taken will also be recorded. The FOL will check to be sure that corrective action has been taken, the corrective action appears effective, and the problem has been fully solved. The Project Manager will receive a copy of the master site notebooks and will file them in the project QA file.

8.2 LABORATORY

At the laboratory level, re-analysis and other corrective measures are contractually required if specific control limits established in the standard methods are exceeded. The bench chemist directly responsible for the test knows the current operating and acceptance limits, and will take corrective actions required, including sample re-analysis. Bench results are also reviewed to insure that all method-specified QA requirements have been met. Each person in the review process has the authority to require re-extraction and re-analysis of a sample if QC problems are identified.

8.3 AUDITS

If data validation or QC audits result in detection of unacceptable data, the PM will be responsible for developing and initiating corrective action. The project QA Officer will be notified of the non-conformance and will oversee any corrective action to verify problem resolution. Corrective action may include:

- Re-analyzing samples if holding time criteria permit
- Re-sampling and analyzing
- Evaluating and amending sampling and analytical procedures
- Accepting data acknowledging level of uncertainty

Data inadequacies attributable to site-specific interferences or conditions may require that sampling procedures or analytical methods be modified.

9.0 QUALITY ASSURANCE REPORTS

No separate QA report for this project is anticipated. The final investigation report will contain separate QA sections that summarize data quality information collected during the project.

10.0 REFERENCES

United States Environmental Protection Agency, Region II CERCLA Quality Assurance Manual, Revision 1, October, 1989.

New Jersey Department of Environmental Protection, Field Sampling Procedures Manual, February, 1988.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Substances
and Disease Registry

Memorandum

Date April 27, 1990

From Chief Toxicologist, Emergency Response and Coordination Branch (ERCB), Division of Health Assessment and Consultation (DHAC), ATSDR (E32)

Subject Health Consultation: Waltons Farm Site
Delran Township, New Jersey

To Mr. William Nelson
ATSDR Regional Services Representative
U.S. EPA Region I
Through: Chief, ERCB, DHAC, ATSDR (E32)

BACKGROUND AND STATEMENT OF ISSUES

The Agency was asked by the U.S. Environmental Protection Agency (EPA), Region II, to review the results of a preliminary analysis of soils and sediments from Waltons Farm and to determine the health significance of the contamination detected at the site. Of primary concern to EPA, are the levels of chlorinated dibenzodioxins (CDDs) and dibenzofurans (CDFs). The potent animal carcinogen, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) was not detected at the site. The site is not on the EPA National Priorities List (NPL).

The Waltons Farm Site encompasses about a 1/4-acre area and is a former pesticide dump. Apparently, the dump was set afire in the 1950s. No other data were made available for ATSDR review.

DOCUMENTS AND INFORMATION REVIEWED

1. Memorandum, from Paul Rosiers, Dioxin Disposal Advisory Group, to Don Graham, U.S. EPA Region II, transmitting 3 pages of preliminary analytical data on Waltons Farm Site, April 18, 1990, Fax to ATSDR on April 23, 1990.

2. ATSDR Toxicological Profile for 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (ATSDR/TP-88/23), June 1989.

3. Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and -Dibenzofurans (CDDs and CDFs) and 1989 Update, Risk Assessment Forum, U.S. EPA, March 1989.

DISCUSSION

The data package provided to ATSDR contained the analytical results of 10 soil samples taken from either surface soil (depth of sampling not defined) or subsurface soil. No information was provided about populations near the site or activities at or around the site. The ATSDR assumes that access to the site is unrestricted.

Analytical results were presented in terms of parts per billion (ppb) and in terms of the TCDD "toxicity equivalence factor" (TEF) which relates the "toxicity" of CDDs and CDFs to TCDD. In general, CDDs and CDFs which have chlorines on positions 2, 3, 7, and 8 of the same molecule are of greatest concern. In comparison to TCDD, which contains 4 chlorine atoms per molecule, toxicity potential decreases as the chlorine content increases. Thus TCDD, is considered to be 100 times more toxic than CDDs or CDFs containing 7 chlorines (positions 2,3,7 and 8 occupied by chlorines), and 1,000 times more toxic than compounds containing 8 chlorines.

The Centers for Disease Control (CDC) has established that a level of 1 ppb and above of TCDD in residential soils is of public health concern. In terms of TEFs, none of the areas sampled exceeded 1 ppb. The contaminants detected at sampling locations 1-9 were predominately CDDs and CDFs that contained eight chlorines per molecule; TFE values, according to this reviewer's calculations were less than 0.02. The TEFs listed in the data package were at least an order of magnitude greater than those calculated here (see Attachment 1). It is not clear what lead to the different estimates of TEF. Nevertheless, the TEFs did not exceed 1 ppb, with the exception of sampling location 10.

The subsurface sample at location 10 contained a variety of compounds with 4, 5, 6, 7, and 8 chlorines per molecule. The maximum TEF was estimated to be 1.06 ppb. Whether higher levels of CDDs or CDFs were present in the surface soil at location #10 could not be determined from the data available to ATSDR.

CONCLUSIONS

Based on the available information, ATSDR concludes that the compounds and the levels of the compounds present at this site do not represent a public health concern. This conclusion is based solely on the presence of the CDDs and CDFs. No data were provided about other contaminants or about site conditions.

RECOMMENDATIONS

1. None.

If additional information becomes available, or you desire further clarification or assistance, please do not hesitate to contact me or this office.

Allan S. Susten

Allan S. Susten, Ph.D., DABT

Attachment

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Subs
and Disease Registr

Memorandu

Date June 20, 1991

From Environmental Health Scientist, Technical Support Section, Emergency Response and Consultation Branch, DHAC, ATSDR (E-32)

Subject Health Consultation: Walton's Farm Site
Delran Township, Burlington County, NJ

To Lisa Voyce
ATSDR Regional Representative
U.S. EPA, Region II
Through: Director, DHAC, ATSDR (E-32)
Acting Chief, ERCB, DHAC (E-32)
Chief, TSS, ERCB (E-32)

BACKGROUND AND STATEMENT OF ISSUES

The Agency for Toxic Substances and Disease Registry (ATSDR) was requested by the U.S. Environmental Protection Agency (EPA) to review the proposed clean-up level for DDT in soil at the Walton's Farm site and to determine if the level was protective of public health. A verbal health consultation was provided to EPA on May 16, 1991; this health consultation is written to confirm the verbal ATSDR determination relayed to EPA.

The Walton's Farm site is a 34-acre farm located in Delran Township, New Jersey. The site is located in an old agricultural area. Approximately 1/4-acre of this farm was reportedly used as a pesticide dump from sometime prior to 1945 until at least 1952. The nearest resident is located approximately 1/4-mile south of the site. The dump area is located adjacent to the mud flats of Rancocas Creek. Erosion channels from the dump to the creek are reported visible. The Rancocas Creek empties into the Delaware River which receives high recreational use. The Rancocas Creek estuary area is used for hunting and fishing.

Results of EPA and the New Jersey Department of Environmental Protection (NJDEP) sampling efforts indicate that the primary site contaminant is DDT. Slightly elevated levels of DDE, DDD, arsenic, and n-nitrosodiphenylamine were also detected. Concentrations of DDT as high as 380,000 parts per million (ppm) in the landfill area and 43 ppm in the creek sediment were detected. DDE and DDD were detected in the landfill at 1,500 and 1,800 ppm, respectively. Arsenic was found at 160 ppm in the landfill area and at 33 ppm in the creek sediment. N-nitroso-diphenylamine was detected at 870 ppm in the landfill.

The EPA has proposed using the NJDEP-recommended 10 ppm action level for DDT as the clean-up level for this site. It is believed that by removing the most prevalent contaminant from the

site, the other contaminants found at much lower concentrations will also be removed.

DOCUMENTS AND INFORMATION REVIEWED

Memorandum: Walton's Farm Site, Delran Twp., NJ. From: Donald R. Graham, OSC (EPA Region II), To: Lisa Voyce, Region II ATSDR Representative. May 9, 1991.

Sampling Trip Report, Walton's Farm. U.S. EPA's Technical Assistance Team (TAT-02-F-0260). March 21, 1991.

U.S. EPA Action Memorandum: Removal Site Evaluation and Request for Removal Action Approval at the Walton's Farm Site. January 7, 1991.

Telephone Conference: EPA OSC, Donald Graham; ATSDR, Lynn Wilder and Lisa Voyce. May 16, 1991.

Toxicological Profile for p,p'-DDT, p,p'-DDE, and p,p'-DDD. ATSDR/TP-89/08.

Toxicological Profile for Arsenic. ATSDR/TP-88/02.

Toxicological Profile for N-nitrosodiphenylamine. ATSDR/TP-88/20.

DISCUSSION

The proposed clean-up level of 10 ppm DDT at the site is expected to remove other contaminants that are present in the landfill soils. Assuming that the contaminants are evenly intermixed with the DDT contamination, the removal of DDT-contaminated soil is expected to remove other contaminants. By removing the contaminated soils, the current potential for direct dermal contact and other direct routes of exposure (inhalation and ingestion) with on-site contaminants will be eliminated.

The sampling information reviewed indicated that contaminant migration from the dump site into the Rancocus Creek is occurring. As this creek and the Delaware River are both used by the public for hunting, fishing, and other recreational activities, the most feasible pathway of human exposure from site-related contaminants is through ingestion of contaminated fish and wild game.

The lipophilic property and the long half-life of DDT, DDE, and DDD compounds lead to their bioaccumulation in the food chain. In some cases, the ratio of the concentration of the compound in

the organism relative to the environmental concentration can be quite high. For DDT in humans, this ratio has been estimated to be a factor of 1646. Given the DDT concentration (43 ppm) found in the creek sediment sample collected near the site, it would appear that runoff from the site could cause DDT bioaccumulation in organisms and fish that exist in the creek, and lead to human exposure if these organisms are consumed. Although DDT contamination of the creek may be the result of other sources in the area, the concentrations of the contaminant found at this site and the site's close proximity to the creek indicate that the site is a significant contributor to contaminants found in the creek sediment.

The ATSDR Minimal Risk Level (MRL) for long term ingestion of DDT, DDD, and DDE is 0.00035 milligrams (mg) per kilogram (kg) body weight per day. This MRL is derived from a 60-day animal study. If a person is exposed to DDT in a concentration less than or equal to the MRL, no harmful noncarcinogenic effects are expected to occur. Therefore, if a 70 kg adult ingests up to 24.5 micrograms (ug) of DDT on a daily basis, no harmful noncarcinogenic effects should occur. EPA considers DDT to be a potential human carcinogen, as high exposures of DDT in animal studies have produced cancer. No known human cancers have been shown to be the result of exposure to DDT.

CONCLUSION

The ATSDR concurs with the EPA proposed clean-up level of 10 ppm for DDT-contaminated soil at this site. The 10 ppm cleanup level should eliminate the potential for direct exposures to landfill contaminants and will prevent further runoff of high concentrations of DDT from the site into Rancocas Creek. Insufficient information was provided to determine the potential past and present threat posed by ingestion of area fish and wild game.

RECOMMENDATIONS

1. Ensure that additional off-site migration (air and surface runoff) of site-related contaminants does not occur during the removal process.

2. Ensure that contaminant levels have been sufficiently reduced after the soil has been removed.

3. If fishing and hunting are continuing near the site in the Rancocas Creek area, investigate the potential bioaccumulation of site-related contaminants in area fish and wildlife commonly consumed by humans. If

ingestion of contaminated fish and wildlife is found to be a current pathway of exposure from the site, ATSDR will be available to review any fish and wildlife sampling data and comment on the public health implications.

If further clarification is required, or if additional information becomes available, please do not hesitate to contact this office at (404) 639-0616.

Lynn C. Wilder

United States
Environmental Protection Agency
Region 2: New Jersey, New York
Puerto Rico, Virgin Islands
26 Federal Plaza, NY, NY 10278

NEWS

91(228) Mary Breitenbach (212) 264-2515

FOR RELEASE: Monday, November 18, 1991

COMPANY AGREES TO UNDERTAKE CLEAN-UP ACTION AT THE WALTON'S FARM SITE IN DELRAN TOWNSHIP, NEW JERSEY

New York -- the U.S. Environmental Protection Agency (EPA) has signed an agreement with PPG Industries, Inc. (PPG) to remediate contaminated soils and sediments at Walton's Farm, located in Delran Township, N.J. The clean-up is a Superfund removal action. Superfund is the federal program for addressing hazardous waste sites.

The Walton Farm is a 37 acre parcel located adjacent to the Rancocas Creek in Delran Township, N.J. A half-acre portion of the farm, directly adjacent to the creek, was used for the disposal of powdered chemicals, primarily pesticides, from approximately 1940 to 1952. The soils in and around the immediate disposal area, as well as sediments in the area of the creek directly adjacent to the disposal area, are contaminated.

The site was brought to the Agency's attention by the New Jersey Department of Environmental Protection and Energy (NJDEPE). Sampling conducted by the NJDEPE, later confirmed by the EPA, showed excessive concentrations of numerous pesticides, especially DDT, and lesser concentrations of heavy metals and

(more)

volatile and semi-volatile compounds.

PPG, a party responsible for contamination on the site, has agreed to perform the clean-up work, at an estimated cost of $2 million, under the oversight of the EPA. Sampling work has already begun at the site. Once the results of the samples have been fully analyzed, the soils and sediments will be physically removed from the site and properly disposed of. The excavation of the soils is expected in the next several months.

United States
Environmental Protection Agency
Region 2: New Jersey, New York
Puerto Rico, Virgin Islands
26 Federal Plaza, NY, NY 10278

FACT

SUPERFUND UPDATE **NOVEMBER 1991**

WALTON'S FARM SITE
Delran Township, New Jersey

Introduction

This Superfund update serves as a means of informing the public of the U.S. Environmental Protection Agency's (EPA) planned activities for clean-up of the Walton's Farm Site located in Delran Township, Burlington County, New Jersey.

The New Jersey Department of Environmental Protection and Energy (NJDEPE) referred the Walton's Farm Site to EPA in 1990. A Removal Site Evaluation (RSE) was subsequently conducted by EPA. It was determined that the nature of the chemicals present at the site posed an unacceptable risk to the public and the environment. In response to this determination, EPA has signed an agreement with the Potentially Responsible Party (PRP) to conduct a Removal Action at the Walton's Farm Site. A Removal Action is a short term clean-up, aimed at quickly responding to a release or even threatened release of hazardous substances.

Site Background

The Walton's Farm site is located at 313 Creek Road, in Delran Township, New Jersey. The site occupies approximately one-half acre of a 37 acre farm. The site is bordered by the Rancocas Creek to the north and active farmland to the south.

From approximately 1945 to 1952 the site was utilized for the disposal of powdered chemicals, consisting primarily of pesticides. The predominant contaminant identified by EPA and NJDEPE is DDT and its degradation products DDD and DDE.

In June 1986, NJDEPE became aware of the site through information provided by an anonymous source. NJDEPE's subsequent investigation confirmed the presence of DDT, its isomers DDD and DDE, and other pesticides in lesser concentrations. NJDEPE's investigation also identified several PRPs which were then issued an Administrative Consent Order (ACO) for clean-up of the site. When ACO negotiations broke down, NJEPE then referred the Site to EPA for Removal Action consideration.

At NJDEPE's referral, EPA conducted a site investigation in January 1990. Through NJDEPE background information and additional confirmation sampling, EPA determined that the site was eligible for Superfund (Comprehensive Environmental Respons and Liability Act/CERCLA) Removal Action funding.

Concurrent with EPA's site investigation, negotiations were initiated with the principle PRP, Pittsburgh Plate Glass Industries, Inc. (PPG). Negotiations were finalized with PPG's signing of the ACO on October 29, 1991. The consent order serve as PPG's agreement to conduct the remediation activities deemed necessary by EPA within the scope of Superfund.

Removal Activities

Under the oversight of EPA, PPG's contractor began work on the site on November 5, 1991, to initiate the investigation and removal activities stipulated in the ACO. The current on-site activity includes the following and is anticipated to be completed by the end of November:

* sampling of the dump area, soils surrounding the dump area, groundwater, and surface water and sediment of the Rancocas Creek estuary;
* construction of an access road; and
* securing the area by means of installing fencing and warning signs.

After receiving the data generated from current sampling efforts, which are subject to quality control measures, PPG will submit a finalized workplan to EPA for approval. This workplan will address removing contamination of affected soils and sediments, as defined by the site investigation and discussed with EPA. Implementation of the workplan is scheduled for early 1992 with completion by June 1992.

Community Involvement & Further Information

For additional information concerning the removal activities at the Walton's Farm Site, please contact Steve Katz, Community Relations Coordinator at (212) 264-9363 or Don Graham, On-Scene Coordinator at (908) 321-4345.

As part of EPA's continuing efforts to fully inform affected residents, community relations activities will be ongoing throughout the duration of the removal process. EPA has established an Administrative Record for making documents relevant to this Removal Action available for review. The Administrative Record will be available to the public at the following location:

Delran Township Municipal Building
Chester Avenue
Delran, New Jersey 08075

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

JACOB K. JAVITS FEDERAL BUILDING

NEW YORK, NEW YORK 10278

Representatives From the U.S. Environmental Protection Agency Invite You To Attend A Public Availability Session On Friday, November 22 1991 From 4 - 8 PM

Purpose: To Provide an Opportunity for Interested Residents to Discuss Questions on an Informal Basis with EPA Regarding Clean-Up Activities at the Walton Farms Site.

At: Delran Municipal Complex
1050 Chester Avenue
Delran Township, New Jersey
Anytime between 4 and 8 pm.

For Further Information Contact:
Steve Katz
Community Relations Coordinator
(212) 264-9363

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
RESEARCH AND DEVELOPMENT

October 10, 1990

SUBJECT: DDAG Review and Comment of Walton's Farm Site, Delran Turnpike, New Jersey

FROM: Paul E. des Rosiers, Chairman, Dioxin Disposal Advisory Group

TO: Don Graham, OSC
Region II, Removal Action Branch

Reference your memoranda of October 10, 1990, and April 25, 1990, requesting technical assistance from the Dioxin Disposal Advisory Group (DDAG). DDAG reviewed the dioxin (CDDs) and furan (CDFs) analytical data provided earlier and concluded that the former pesticide disposal site, where DDT was detected at [redacted], was not to be considered as containing acutely hazardous waste (so-called F021-F027 RCRA-listed waste) because CDD and CDF levels detected were not of regulatory concern (see attached three-page DDAG guidance of November 15, 1988), that is, > 1 ppb $TCDD_e$ for residential settings or > 20 ppb $TCDD_e$ for industrial sites.

Therefore, the principal organic hazardous constituents (POHCs) should be identified and quantified, such as DDT (a RCRA U061 hazardous waste) and treated accordingly as a RCRA hazardous waste. Options may include excavation, overpacking or supersacking, and thermal treatment at the optimal end (i.e., relative to destruction of POHCs and cost) or disposal in a RCRA-permitted landfill at the low-cost end, if allowed in New Jersey. Another option under Superfund Land Disposal Restriction Guide #6A would be to obtain a soil and debris treatability variance for the removal action (see OSWER Directive: 9347.3-06FS, July 1989) noting that DDT is a halogenated non-polar aromatic (Highlight 5).

Regarding DDAG and its role within the Agency and, in particular, in OSWER, DDAG was created in November 1983 as part of the Agency's Dioxin Strategy to ... "continue to make technical recommendations about site-specific clean-up and disposal/destruction options." DDAG was to report to the Chlorinated Dioxins Work Group (CDWG) to provide technical expertise as necessary, which, in turn, reported to the Dioxin Management Task Force (DMTF), which assisted the AA for OSWER in implementing the overall strategy and functioned as a steering committee that dealt with policy and resource issues. The latter two groups, the CDWG and the DMTF, have ceased to exist; however, DDAG has been retained as a technical consultation group.

Its current function is to provide consistency of remediations with RCRA rules and established dioxin policies. Its interoffice staff composition allows for comprehensive reviews of contemplated or proposed removal actions and recommended alternative or innovative treatments methods.

Enclosure

Enclosure

GENERAL APPROACH USED BY THE DIOXIN DISPOSAL ADVISORY GROUP (DDAG)
REGARDING PENTACHLOROPHENOL WASTE (ALSO PCBs)

- F021--acutely hazardous waste from the production or manufacturing use of pentachlorophenol (PCP) or of intermediates used to produce its derivatives.

- F027--acutely hazardous waste comprising discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. DDAG considers the word "unused" to be a misnomer, since most used or spent formulations contain significant levels of homologues of TCDDs, TCDFs, PCDDs, and PCDFs of toxicological concern, particularly when found in waste pits or lagoons.

- K001--hazardous waste comprising bottom sediment sludge from the treatment of wastewater from wood preserving processes that employ creosote and/or PCP formulations (40 CFR §261.32, p. 378).

DDAG realizes, and OSW is cognizant of the fact, that up to 1400 active/inactive wood treating sites are not legally covered by the RCRA listing rules, even though a red-border package is circulating EPA HQs that proposes to list, only as hazardous, four new wastes, namely, F032, F033, F034 and F035. F032 and F033 deal with wastewaters, process residuals, preservative or protectant drippage, or discarded spent formulations from wood preserving or wood surface protection processes that currently use or have previously used chlorophenolic formulations. F034 and F035 deal with similar waste streams except that creosote formulations and inorganic wood preservatives containing arsenic and chromium are or will be employed.

DDAG feels very strongly that the new hazardous listings F032 and F033 only apply to the generation of new waste. Further, DDAG notes that ORD recently concurred with the referenced red-border only with the stipulation that OSW ensure that the large number of wood preserving sites, which may have old and highly toxic, contaminated waste present, not be allowed to pose unacceptable risks to human health and the environment. Since few of these sites would be affected by the new listings, ORD believes and DDAG agrees that the preamble must seek comments and data regarding this issue and indicate that EPA will: (a) make a conscious effort to consider listing these wastes as acutely hazardous because they contain potent homologues of CDDs/CDFs at levels of regulatory concern and (b) evaluate ways of to ensure that such sites will be effectively managed.

DDAG, as a matter of policy, considers PCP waste (not newly manufactured products) as acutely hazardous because of its TCDDs/TCDFs and PCDDs/PCDFs contents. A Potentially Responsible Party (PRP) may opt to consider such waste as not be covered by RCRA and treat accordingly, but the PRP should explicitly bear in mind its potential, long-term liability regarding ultimate disposition of CDDs/CDFs.

Site Evaluation Relative to Risk Action Levels

- When a PCBs, copper wire/core reclamation, or PCP wood treating site, active or inactive, is encountered, the POHCs (Principal Organic Hazardous Constituents) must be determined by analysis along with homologues of TCDD, TCDF, PCDD, PCDF, HxCDD, HxCDF, HpCDD, HpCDF, OCDD, and OCDF; 2,3,7,8-TCDD and 2,3,7,8-TCDF analyses may also be necessary, particularly if historical evidence indicates that "pit fires" have occurred.

- Toxicity Equivalence Factors (TEFs) (ref. J.S. Bellin and D.G. Barnes, EPA/625/3-87/012, March 1987) are only to be employed for determining an estimate of risk posed by the presence of these isomers/homologues. (TEFs are not to be used as treatment standards.)

Example of Calculation

Analysis of PCP-Contaminated Soil Found at a Residential Property

0.80	ug/kg (ppb)	2,3,7,8-TCDD (isomer)
4.2	"	TCDDs (homologue)
10	"	PCDDs "
24	"	HxCDDs "
48	"	HpCDDs "
582	"	OCDD "
10	"	2,3,7,8-TCDF (isomer)
43	"	TCDFs (homologue)
58	"	PCDFs "
67	"	HxCDFs "
120	"	HpCDFs "
1000	"	OCDF "

Calculation of 2,3,7,8-TCDD Toxicity Equivalents (TEs):

	0.80 x 1	=	0.80	2,3,7,8-TCDD
(4.2-0.8)=	3.4 x 0.01	=	0.034	TCDDs
	10 x 0.5	=	5.0	PCDDs
	24 x 0.04	=	0.96	HxCDDs
	48 x 0.001	=	0.048	HpCDDs
	820 x 0	=	0	OCDD
	10 x 0.1	=	1.0	2,3,7,8-TCDF
(43-10)=	33 x 0.001	=	0.033	TCDFs
	58 x 0.1	=	5.8	PCDFs
	67 x 0.01	=	0.67	HxCDFs
	120 x 0.001	=	0.12	HpCDFs
	1000 x 0	=	0	OCDF
			14.465	ug/kg (ppb)

Since this site represents a residential area, TEs = 14.5 ppb > 1 ppb action level for residences, removal action is warranted. N.B.--Had this been an industrial or non-residential site, then the action level for remediation is > 20 ppb.

Now, if remediation is mandated by the previous procedure, once the acutely hazardous contaminated soil or liquid/sludge waste is removed and treated (by an EPA-approved thermal, chemical, etc. technology), then RCRA treatment standards (based on the Land Restriction Rule FR 51(216), 40642) must be attained as measured in the waste extract#:

F020-F023 and F026-F028 Dioxin Containing Waste	Concentration
TCDDs	< 1 ppb
TCDFs	< 1 ppb
PCDDs	< 1 ppb
PCDFs	< 1 ppb
HxCDDs	< 1 ppb
HxCDFs	< 1 ppb
2,4,5-Trichlorophenol	< 50 ppb
2,4,6-Trichlorophenol	< 50 ppb
2,3,4,6-Tetrachlorophenol	<100 ppb
PCP	< 10 ppb .

Using Methods 3510/8270 identified in SW-846

Further Note: No regional staffer has the authority to redesignate or downgrade a priori a F021 or F027 waste to K001 without seeking appropriate advise from OSW or DDAG. Do not place yourself in such an indefensible position of making a purely subjective decision in order to accede to the desires of a hazardous waste handler or treater who claims that he will dispose of the hazardous waste if such a lower RCRA listing is granted. These PCP wastes are ACUTELY HAZARDOUS and should be treated thusly.

Should the OSC or ERT have a site that possesses the previously mentioned characteristics and/or you feel the need for additional guidance or information, you may call DDAG for technical assistance.

Paul E. des Rosiers
Chairman, Dioxin Disposal Advisory Group
(RD-681), Washington, DC 20460
382-2722

NOV 15 1988

PRELIMINARY RESULTS PCDD/PCDF ANALYSIS

WALTONS FARM

Sample No.	Type	Location	PCDD/PCDF (ppb)	TEF* (ppb)
5301B-01	Surface/Sediment	Creek Bed Location (01)	OCDD (0.98) OCDF (1.20)	0.15
-02	Surface/Soil	Creek Bank Location (02)	OCDD (2.70) OTHERS<1.0	0.16
-03	Subsurface/Soil	24" Below grade at existing hole. Location (03)	None	0.41
-04	Surface/Soil	Location (04)	OCDD (2.90) OCDF (0.86)	0.53
-05	Surface/Soil	Location (05)	OCDD (3.60) OCDF (1.43)	0.50
-06	Surface/Soil	Location (06)	OCDD (10.40) OCDF (9.10)	0.32
-07	Surface/Soil	Sand Spit Location (07)	OCDD (1.60) OCDF (2.25)	0.10
-08	Surface/Soil	Location (08)	OCDD (2.60) OCDF (7.60) OTHERS<0.5	0.05
-09	Subsurface/Soil	6-12" - Below Grade, Location (09)	All<0.5	0.10
-10	Subsurface/Soil	3-6" - Below Grade, Location (10)	(see table 2)	0.75
-11	Surface/Soil Duplicate	Location (06)	OCDD (9.7) OCDF (10.0) OTHERS<1.0	0.50
-12	PEM Sample/Soil	Low Level 2378-TCDD	2378-TCDD (3.0) Total TCDD (7.4)	3.13
-13	PEM Sample/Soil	Low Level PCDD/PCDF	2378-TCDD (1.7) Total TCDD (3.3)	1.75
-14	PEM Sample/Soil	Blind Blank	None Detected	0.16
-15	Rinsate Sample	TCE (liq.)	None Detected (ug/L)	0.01
-16	PEM Sample/Soil	Known Blank	Within QC Limits	N/A

Performance Evaluation

* - Toxicity Equivalents measured in ppb of 2378-TCDD.

Note: TEF takes into account experimental error and is a measure of the maximum possible concentration in terms of toxicity equivalents of 2378-TCDD.

TABLE 2 - PCDD/PCDF Data Summary

Sample No.: 5301B-10

Type: Subsurface/Soil

Location: Location (10)

Description: Sample was taken from first 6" auger bite. Sample consisted of a heterogeneous opaque yellow material of a clay-like consistency, flecked with with white and pink material.

Analyte	Concentration (ppb)	TEF
TETRA TCDD		
2378 TCDD	ND	
TOTAL TCDD	1.77	0
PENTA TCDD		
12378 PeCDD	0.46	→ 0.23
TOTAL PeCDD	3.18	= 0
HEXA TCDD		
123478 HxCDD	0.36	} → 0.24
123678 HxCDD	0.98	
213789 HxCDD	1.08	
TOTAL HxCDD	4.83	= 0
HEPTA TCDD		
1234678 HpCDD	2.24	→ 0.02
TOTAL HpCDD	3.33	= 0
OCTA TCDD		
TOTAL OCDD	9.76	0.01

Analyte	Concentration (ppb)	TEF
TETRA TCDF		
2378 TCDF	ND	
TOTAL TCDF	3.81	= 0
PENTA TCDF		
12378 PeCDF	0.62	→ 0.03
23478 PeCDF	0.41	→ 0.205
TOTAL PeCDF	2.05	= 0 → 0.235
HEXA TCDF		
123478 HxCDF	0.82	} → 0.273
123678 HxCDF	0.40	
123798 HxCDF	0.58	
234678 HxCDF	0.93	
TOTAL HxCDF	3.31	= 0
HEPTA TCDF		
1234678 HpCDF	1.50	} → 0.04
1234789 HpCDF	2.52	
TOTAL HpCDF	4.27	= 0
OCTA TCDF		
TOTAL OCDF	9.72	→ 0.01

Subtotal 0.5 0.56

TEF = 1.06 ppb

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: SEP 25 1991

SUBJECT: Biological Technical Assistance Group (BTAG) Meeting

FROM: Shari Stevens, Coordinator
Biological Technical Assistance Group (2ESD)

TO: Don Graham, Environmental Engineer
Removal Action Branch (2ERRD-RAB)

The following comments represent the consensus of the Region II Biological Technical Assistance Group (BTAG) review (meeting of 12 September 1991) of the "Draft Pre-Removal Sampling and Analysis Plan" for the Walton's Farm site, located in Delran, Burlington County, New Jersey.

We recognize that activities at this site are currently in the removal phase. However, as per your request, we have attempted to identify any reasonably foreseeable concerns that would otherwise need to be addressed at a later stage. Due to the extent and varied ecological nature of this site, an environmental assessment should be performed in order to ensure that a final remedy will be protective of the environment. The BTAG generally recommends a phased approach to ecological assessments, beginning with characterization of ecological resources, identification of the nature and extent of contamination, and potential pathways for contaminant migration. While the draft Site Operations Plan includes some further sampling, it does not appear that sufficient data to determine appropriate remedial activities will be obtained.

For example, the sediment sampling as proposed will not adequately assess the extent of contamination. Due to the tidal nature of the area, additional sediment and surface water samples should be collected from the tidal channel, in Rancocas Creek both "upstream" and "downstream" of the confluence of the Creek and the channel, and in associated wetlands/mudflats in order to fully delineate the extent of contamination. Discrete samples (as opposed to composite samples) should be collected from the top six inches of sediments in depositional areas. Additionally, we recommend that TOC and grain size analyses be performed on all sediment samples; these analyses will assist in determining properties of the sediments which will affect contaminant migration and bioavailability.

We do not believe that it is appropriate to conclude that dredging will not be necessary without further information. Although DDT and DDE possess very low water solubilities, the potential for contaminants to be present in surface water should not be assumed without additional sampling. Surface water samples should optimally be collected after a storm event when a most conservative evaluation of stormwater runoff could be made.

We are interested in obtaining feedback from the Project Managers concerning the usefulness of BTAG comments. Please contact me if the comments have been useful or, especially, if they have not, so we can better adjust our reviews and procedures.

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EPA REGIONAL GUIDANCE DOCUMENTS

The following documents are available for public review at EPA Region II Headquarters, Raritan Depot, Woodbridge Avenue, Edison, New Jersey during regular business hours. Contact Douglas Kodama (908) 906-6905 for more information.

* Glossary of EPA Acronyms

* Superfund Removal Procedures--Revision #3. Office of Solid Waste and Emergency Response, (OSWER) Directive 9360.0-03B, February 1988.

* Hazardous Waste Operations and Emergency Response. Notice of Proposed Rulemaking and Public Hearings. 29 CFR Part 1910, Monday, August 10, 1987.

* Guidance on Implementation of Revised Statutory Limits on Removal Action. OSWER Directive 9260.0-12, May 25, 1988.

* Redelegation of Authority under CERCLA and SARA. OSWER Directive 9012.0-02B, April 1988.

* Field Standard Operating Procedures (FSOP)
  - #4 Site Entry
  - #6 Work Zones
  - #8 Air Surveillance
  - #9 Site Safety Plan

* Standard Operating Safety Guides--U.S. EPA Office of Emergency and Remedial Response, July 5, 1988.

* Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

* Superfund Amendments and Reauthorization Act of 1986 (SARA).

* National Oil and Hazardous Substances Pollution Contingency Plan (NCP).